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MESA-BIERE 1-22 GROUNDWATER INVESTIGATION, NORTHEASTERN MONTANA

SEMIANNUAL MONITORING REPORT

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1. INTRODUCTION

The Mesa-Biere 1-22 groundwater monitoring network is located near the southern portion of the East Poplar Oil Field in the Williston Basin and northeast of the City of Poplar, Montana, within the Fort Peck Indian Reservation. The Mesa-Biere production well was successfully plugged in 2000. Since that time, Pioneer Natural Resources (Pioneer) has conducted numerous hydrogeologic studies of the Mesa-Biere 1-22 well site and surrounding area in accordance with the U.S. Environmental Protection Agency (EPA) Emergency Administrative Order upon Consent (EAOC) #SWDA 08-2001-0027. Site investigations to date have included the drilling and installation of numerous monitoring wells, conducting multiple aquifer tests to define site aquifer properties, extensive borehole and surface geophysical investigations, and the design and installation of a groundwater remediation system comprised of 12 brine recovery wells, 2 tank batteries, and a Class V injection well.

More than ten years of groundwater sampling and data collection across the site has resulted in reduced monitoring requirements for the Mesa-Biere Groundwater Project and includes sampling of area monitoring wells, domestic wells, and brine recovery wells for total dissolved solids (TDS), chloride, and in some cases benzene, toluene, ethylbenzene, and total xylenes (BTEX).

This report summarizes groundwater sampling results from the most recent sampling event conducted May 15 through May 20, 2012 and is submitted by Geosyntec on behalf of Pioneer in response to, and in accordance with, the U.S. EPA EAOC and the September 2011 U.S. EPA modified sampling and analysis plan for the Mesa-Biere 1-22 Groundwater Monitoring project.

Site activities during May 2012 included sampling and monitoring of 28 monitoring wells, 4 domestic wells, and 12 brine recovery wells, as well as the drilling and installation of one brine recovery well, two product recovery wells, and two monitoring wells. Groundwater sampling included measurement of static water levels, monitoring of onsite field parameters (conductivity, temperature, pH, and dissolved oxygen) and collection of groundwater samples for analysis of TDS, chloride, and BTEX. Groundwater sampling was conducted in accordance with the Mesa-Biere 1-22 groundwater project sampling and analysis plan and U.S. EPA-approved protocols and methods.

2. SITE DESCRIPTION AND BACKGROUND

2.1 Site Location

The Mesa-Biere 1-22 Groundwater project site is located in the southern portion of the East Poplar Oil Field in Roosevelt County, northeast of the City of Poplar, Montana. The site monitoring network extends from the Mesa-Biere 1-22 production well source area in the SW quarter of Sec.22, T28N, R51E, to include wells in Sections 15, 16, 21, 27, 28, and 29 (Figure 1). The study area spans both ancestral and modern terraces that trend west toward the Poplar River Valley, located approximately 2 miles west of the production well location.

Area topography generally consists of a broad glacial bench with low relief, dissected by the Poplar River and its tributaries. Current land surfaces are the result of the effects of Pleistocene glaciation in conjunction with the erosional features of large rivers to the west and south of the project area, the Poplar River and the Missouri River respectively.

Soils surrounding the Mesa-Biere site are predominately Dooley sandy loam, a well-drained calcium carbonate soil, exhibiting slow runoff with moderately slow or slow permeability (Montana SSURGO soils database, NRCS[2011]). Soils are fine textured and nonhydric with low organic composition. Water holding capacity for the soils is somewhat limited and depth to water in this soil type is typically greater than 6 feet.

2.2 Site History

Drilled and completed by Mesa Petroleum (Mesa) on June 8, 1970, the Mesa-Biere 1-22 production well was operated for a total of 10 years, from 1970-1972 and from 1976-1984. In 1986 the well was plugged and abandoned by Mesa due to a casing leak. In June of 1985, within 9 months of plugging the production well, fluid flowed to the surface at the Mesa-Biere 1-22. In response, Mesa drilled a relief well to the north-northeast of the production well location and injected additional cement into the formation, which appeared to successfully stop the flow of water. In 1997 Mesa merged with Parker & Parsley Petroleum, forming Pioneer.

In 1999, a number of the area residents and the U.S. EPA filed suit against four of the companies with holdings in the East Poplar Unit: Murphy Oil and Gas, Samson Hydrocarbon, Marathon Oil, and Pioneer. The respondents joined in an EAOC with U.S. EPA (#SDWA 8-99-68, which was later replaced with the current #SWDA 08-2004-0035) with the conditions that the companies conduct a public water supply threat study and construct a public water system to provide the affected landowners with municipal water from the City of Poplar.

As per the original EAOC, in May 2000 Pioneer installed 8 monitoring wells in the immediate vicinity of the Mesa-Biere 1-22 well site for further investigation. Analytical and field results from the initial round of sampling, which included 2 existing monitoring wells and 4 domestic wells, indicated that the Mesa-Biere 1-22 well was an ongoing source of groundwater contamination. It was determined that oil-field produced water along with some associated crude oil was channeling upward into the shallow drinking water aquifer (Jacobs et al., 2008). In a separate U.S. EPA EAOC (#SWDA 08-2001-0027), Pioneer was required to plug the Mesa-Biere 1-22 well and conduct further sampling.

In July of 2001 with the approval of the U.S. EPA, Pioneer drilled 3 injection wells to the Judith River Formation and re-entered the old relief well. The 4 wells were then used to pump Halliburton's Injectrol product to seal off the brine leak from the Mesa-Biere 1-22 well. In the 11 years since the successful re-entry and plugging of the production well, Pioneer has worked diligently to accurately characterize, delineate, and monitor the resultant contaminant plume. The voluntary design, construction, and operation and maintenance of a site groundwater remediation system is only further evidence of Pioneer's commitment to the area, consistently exceeding the requirements set forth in the EAOC.

The Mesa-Biere 1-22 groundwater remediation system became operational in August of 2008. The system is composed of 12 brine extraction wells, 6 product recovery wells in the plume proper, 2 tank batteries, and a 7,800-foot Class V, U.S.EPA-permitted injection well (PNR SWD-1). The injection well is permitted for disposal of 10,000 barrels per day (bbl/d) of contaminated groundwater into the Mississippian, Mission Canyon, and Devonian Nisku Formations, far below and hydrologically separate from the affected shallow aquifers comprising the study area.

To date the remediation system has removed over 203,305,704 gallons (4,840,612 bbls) of brine-contaminated water, an estimated 36% of the total plume volume at a current rate of approximately 217,140 gallons (5,170 bbls) per day from the aquifer (Mike Jacobs, personal communication, June 27, 2012). Pioneer continues to monitor system performance through an extensive monitoring network and geophysical surveys to maximize the remediation system effectiveness.

2.3 Geology and Hydrogeology

The Mesa-Biere 1-22 groundwater investigation site is located near the western boundary of the Williston Basin, in close proximity to the center of the Poplar Anticline estimated to be 10 miles north of the City of Poplar, trending northwest and is

approximately 30 miles long and 25 miles wide (Hamke, 1966). Area surface geology is composed of thick Pleistocene glacial deposits atop the benches. Glacial deposits are replaced and overlain in the alluvial valleys by more recent Holocene alluvium, comprised of fine- to coarse-grained floodplain deposits of the Missouri River and its major tributaries, including the Poplar River, west of the project location (Colton, 1963). Holocene alluvial deposits are predominately silty in nature with local gravel lenses. This unit can also include colluvial and lacustrine deposits as well as remnants of glacial outwash.

Holocene and Quaternary sediments are underlain by the Upper Cretaceous Bearpaw Shale, a relatively thick and essentially impervious formation ranging from 700 to 1,000 feet in thickness (Thamke and Craigg, 1997). The Bearpaw Shale is comprised primarily of marine shale and claystone with thin beds of bentonite clays, and slopes generally to the west.

The water-bearing Quaternary sand and gravel deposits (the Wiota Gravel, alluvium, and alluvium/fan colluvium) are the primary developed source of groundwater for area residents. Water within these deposits generally occurs under unconfined conditions, although due to the heterogeneous nature of the sediments, confined and semiconfined conditions occur as well. Low permeability of the underlying Bearpaw Shale prohibits any significant vertical flow or transport. Regionally depth to water can range from 7 to 130 feet in the glacial deposits and from 5 to 44 feet in the alluvium (Thamke et al., 1996).

The Mesa-Biere 1-22 well site is located on the Biere upper terrace, an ancestral bench of the Poplar River and is underlain by Quaternary deposits of varying thickness. Wells located on the Biere upper terrace exhibit an average depth to the upper Wiota Gravel aquifer of approximately 41 feet below ground surface (bgs) and a depth to the Bearpaw Shale of 62 feet bgs. The Wiota aquifer is no longer used as a domestic water supply source in the vicinity of the Mesa-Biere 1-22 well.

Regional groundwater flow is primarily toward the Poplar River Valley to the west of the project area, and then south along the Poplar River alluvium toward the Missouri River Valley. Local variations in the regional groundwater flow path have been identified within the study area on the Biere upper terrace. Groundwater flow and transport are limited by the thinning and absence of the Wiota Gravel and areas of low hydraulic conductivity along the western portion of the study area (HKM, 2007; DBS&A, 2007; SSP&A, 2008).

3. FIELD INVESTIGATIONS

The May 2012 semiannual sampling event was conducted from May 15 through May 20, 2012, and consisted of the following tasks:

- Drilling and installation of 2 monitoring wells, 1 brine recovery well, and 2 product recovery wells
- Measurement of static water levels for 43 monitoring wells, 5 domestic wells, and 12 brine recovery wells
- Monitoring of groundwater field parameters, including conductivity, temperature, pH, and dissolved oxygen
- Collection of groundwater samples from 28 monitoring wells, 4 domestic wells, and 12 brine recovery wells for analysis of TDS, chloride, and BTEX

All operating procedures for sampling were conducted in accordance with the Mesa-Biere 1-22 groundwater investigation sampling and analysis plan and U.S. EPA-approved protocols and methods.

3.1 Well Drilling and Installation

Five wells (PNR-40-12, PNR-41-12, PNR-PRW-5, PNR-PRW-6, and PNR-RW-13) were installed from May 16 to May 22 on the Mesa-Biere 1-22 groundwater project site by Ron Askin Drilling out of Miles City, Montana, using air rotary drilling methods (Figure 1). PNR-40-12 and PNR-41-12 were installed to enhance water quality and geologic data resolution in the N½NE¼, Sec. 28, T28N, R51E. PNR-RW-13 was installed just north of PNR-RW-11 in the NE¼SW¼, Sec. 21, T28N, R51E to enhance brine recovery within this area. PNR-PRW-5 and PNR-PRW-6 were installed to increase product recovery in the NW¼SW¼ Sec. 22, T28N, R51E.

Monitoring wells (PNR-40-12 and PNR-41-12) and brine recovery well (PNR-RW-13) boreholes were advanced through the glacial till and water-bearing gravels to a completion depth of 10 feet below the surface of the Bearpaw Shale for geophysical logging purposes. Product recovery wells (PNR-PRW-5 and PNR-PRW-6) boreholes were advanced and wells completed 10 feet below the average static water level in each well location to allow for product recovery near the Northern Tank Battery. Geologic samples were collected every 5 feet and at each lithological change. Borehole lithology and well construction details for the new wells are included in Appendix A.

3.2 Groundwater Level Measurements

Wells were gauged using an electronic interface probe capable of detecting water and light nonaqueous-phase liquid (LNAPL) with a precision of 0.01 foot. Project personnel recorded static water levels prior to purging and sampling of each well (Table 1). Measureable product was detected in three of the monitoring wells (PNR-17, PNR-25, and PNR-26) and is summarized in Table 1.

Water levels measured throughout the monitoring network during the sampling event ranged from 1854.85 feet above mean sea level (feet msl) at MOC-20B in the lower ancestral Poplar River terrace, to 2103.69 feet msl at PNR-6, in the older terrace to the east of the Biere. The static water levels on the Biere upper terrace ranged from 1953.75 to 2058.95 feet msl, averaged 2035.50 feet msl, and had a average depth of 42.86 feet bgs. May 2012 static water levels indicate a localized site flow direction to the south-southwest with an average hydraulic gradient of approximately 0.001 (Figure 1).

3.3 Groundwater Sampling

Groundwater samples were collected from 28 monitoring wells, 4 domestic wells, and 12 recovery wells. Field parameters were measured in a flow through cell for all monitoring and domestic wells, and a clean sample container for the recovery wells. Once field parameters had stabilized, samples were collected, preserved, and stored as directed by the analytical laboratory. Quality control samples comprised approximately 10 percent of the total set submitted for laboratory analysis. Percent differences of field duplicate ground water sample constituents did not exceed 10 percent for any sample. Groundwater sampling and decontamination proceedures were conducted in accordance with the Mesa-Biere 1-22 groundwater project sampling and analysis plan and U.S. EPA-approved protocols and methods.

Prior to sample collection, monitoring and domestic wells were purged by use of a decontaminated portable submersible pump. The brine recovery wells operate with dedicated pumps on a continuous basis, requiring minimal additional purging prior to sample collection.

4. ANALYSIS AND OBSERVATIONS

Groundwater samples were analyzed for TDS and chlorides, the two primary established indicator parameters for the brine contamination, as well as for BTEX according to the modified U.S. EPA sampling agreement. Analytical results are summarized in Tables 2 through 4. Complete analytical reports are provided in Appendix B.

4.1 Monitoring Well Network

The Mesa-Biere 1-22 groundwater monitoring well network is comprised of 37 wells. Monitoring wells are sampled on either a semiannual or annual schedule based on legacy water chemistry data and approved by the U.S. EPA and, in accordance with, the EAOC. Analytical results from the May 2012 event are presented in Tables 2 and 3.

4.1.1 Source Area Wells

Wells PNR-5, PNR-14, and PNR-23 are the closest wells within the monitoring network to the Mesa-Biere 1-22 production well. TDS concentrations in these wells have decreased by an average of 20 percent since May 2011 and by 66 percent since the activation of the remediation system. Chloride concentrations within the source area have decreased by an average of 32 percent since May 2011 and by 78 percent since the remediation system became operational.

4.1.2 Western Boundary

The westernmost extent and boundary of the brine plume is defined by 7 wells (PNR-7, PNR-8, PNR-16, PNR-19, PNR-34-07, PNR-35-07, PNR-39-08). The majority of these wells sampled during the May 2012 event indicate a decrease in chloride and TDS concentrations since last year, on average by 18 and 27 percent, respectively. The monitoring wells also exhibit a decrease in chloride and TDS concentrations since activation of the remediation system of 28 percent and 31 percent, respectively. The results indicate that the remediation system continues to actively limit contaminant movement to the west. The exception to this is evident at wells PNR-8, which exhibited increasing chloride and TDS concentrations again this sampling round.

4.1.3 Southern Boundary

Five monitoring wells (PNR-39-08, PNR-29, PNR-28, PNR-27, and PNR-33-06) are used to delineate the southernmost edge of the brine plume. Two of these wells, PNR-29 and PNR-33-06, are on an annual sampling schedule and were not sampled during

the May 2012 event. Average chloride concentrations in the remaining wells have decreased by 25 percent since last year and by 36 percent since activation of the remediation system. TDS concentrations in these wells follow the same downward trend and show a decrease of 33 percent since last year at this time and 39 percent since the remediation system became operational. These values provide additional evidence that the plume is being effectively contained to the south.

Of the monitoring wells analyzed for BTEX, only PNR-7 and PNR-20 both had benzene levels detected above quantitation limits with concentrations of 30 µg/L and 18 µg/L respectively, a decrease in concentration in PNR-7 and a slight increase in concentrations in PNR-20. Benzene was detected at levels lower than quantitation limits in PNR-19, -23, and -24, the concentrations of all of which continue to decrease. Toluene was detected at levels lower than quantitation in wells PNR-20, -23, and -24, Ethylbenzene was detected in only one well, PNR-24, at a concentration of 5.6 µg/L, a value which has continued to decrease in this well. PNR-24 also had a total xylenes concentration of 7.2 µg/L in addition to one other well, PNR-23, that had total xylene concentrations lower than the level of quantitation.

4.2 Domestic Water Supply Wells

In accordance with the modified monitoring agreement, 4 domestic wells (M-27, M-28, M-31, and M-60) were sampled in May 2012. These wells have been abandoned and are no longer used for domestic supply purposes. Wells M-28 and M-31 are immediately downgradient of the Mesa-Biere 1-22 well location and are completed in the Biere upper terrace. Well M-28 is the closest domestic well to the contaminant source (the Mesa-Biere 1-22 production well) and continued to show marked improvement in water quality, with a chloride concentration of 1,560 mg/L. This value represents a 95 percent decrease from the peak measured concentration and a 94 percent decrease since activation of the remediation system. M-31, located just south and slightly west of M-28, also shows improvement since activation of the remediation system, with a decrease in chloride concentration of 14 percent. Due to subsurface plume migration, well M-31 now appears to be near the center of the contaminant plume and consequently has the highest chloride concentration of any of the domestic wells sampled (31,000 mg/L). Both domestic wells (M-28 and M-31) completed on the Biere upper terrace have shown improvement and significant reduction in chloride concentrations since sampling first began in 2000, with an average decrease of 94 percent chlorides and 60 percent reduction in TDS.

Well M-27, upgradient from the Mesa-Biere 1-22 well, exhibited no significant change in chloride concentration since activation of the remediation system. The chloride

concentration in this well is still increasing from the original value of 5,280 mg/L to 6,760 mg/L in May 2012 (a 28 percent increase in chloride).

Well M-60, located to the southwest of the production well in the lower Poplar River alluvial valley, shows an increase in chloride concentration of 25 percent since the activation remediation system. The chloride concentration in this well has more than doubled since monitoring began in May 2000.

Benzene was detected in only one well, M-31, at a concentration of 26 micrograms per liter (μg/L). No toluene, ethylbenzene, or total xylenes were detected in any of the domestic wells sampled.

4.3 Brine Recovery Well Network

The Pioneer brine recovery well network is comprised of 12 recovery wells (PNR-RW-1, -2, -3, -4, -5, -6, -8, -9, -10, -11, -12, and -13) as shown in Figure 1. Recovery wells PNR-RW-9, -10, -11, and -13 are located near the Northern Tank Battery closest to the Mesa-Biere 1-22 well site. Wells PNR-RW-1,-2,-3,-4, and -5 are located just north of the Southern Tank Battery nearest the Class V Injection Well (SWD-1). The westernmost recovery wells are PNR-RW-6,-8, and -12.

In the brine recovery wells nearest the Mesa-Biere 1-22 well site (and Northern Tank Battery), the average chloride concentration was 10,873 mg/L, a 30 percent decrease compared to last year. The recovery wells closest to injection well SWD-1 and the Southern Tank Battery exhibited an average May 2012 chloride concentration of 12,864 mg/L, and showed no significant difference from the previous year. In the westernmost recovery wells, the average chloride concentration was 11,667 mg/L, a 33 percent decrease compared to last year.

Benzene was not detected in two of the brine recovery wells (PNR-RW-6 and PNR-RW-8). New recovery well PNR-RW-13 had a benzene concentration of 5 μg/L. The remaining brine recovery wells exhibited decreasing benzene concentrations over time. Water quality information for the brine recovery wells is listed in Table 4.

5. SUMMARY AND CONCLUSIONS

The results of the semiannual sampling conducted in May 2012 in accordance with EAOC #SWDA 08-2001-0027 and the U.S. EPA September 2011 modified sampling and analysis plan for the Mesa-Biere 1-22 well site provide evidence for the following conclusions:

- Subsurface conditions surrounding the Mesa-Biere 1-22 well site are characterized by the heterogeneous nature of the site geology. Depth to groundwater for May 2012 in the Biere upper terrace averaged approximately 42.86 feet bgs (2035.50 feet msl).
- Groundwater flow in the study area is to the south-southwest with an average hydraulic gradient of approximately 0.001.
- New monitoring wells PNR-40-12 and PNR-41-12 exhibited a shallow depth to Bearpaw Shale and indicate that contaminant concentrations in this area are limited in part due to the topography of the bedrock surface.
- Water quality results, specifically TDS and chloride concentrations of 29,400 mg/L and 19,900 mg/L respectively, indicate that the placement of the additional brine recovery well (PNR-RW-13) just west of the Northern Tank Battery should increase remediation system efficiency and brine recovery to the north.
- Benzene concentrations (where encountered) continue to show a decreasing trend throughout the monitoring network except in monitoring wells PNR-20 and PNR-23 which will be monitored closely over the next sampling events.
- Chloride concentrations in monitoring wells closest to the Mesa-Biere 1-22 well site have decreased an average of 73 percent since system activation. Western and southern boundaries of the plume (as defined through the monitoring network) decreased by an average of 18 to 25 percent relative to last year and 28 to 36 since the remediation system became operational. The exception to this is PNR-8 in which chloride concentrations have increased slightly over the last two sampling events. PNR-8 will continue to be monitored closely during future sampling events.
- Current monitoring data indicate that the remediation system is effectively limiting plume migration to the south since activation of the system in 2008.

6. REFERENCES

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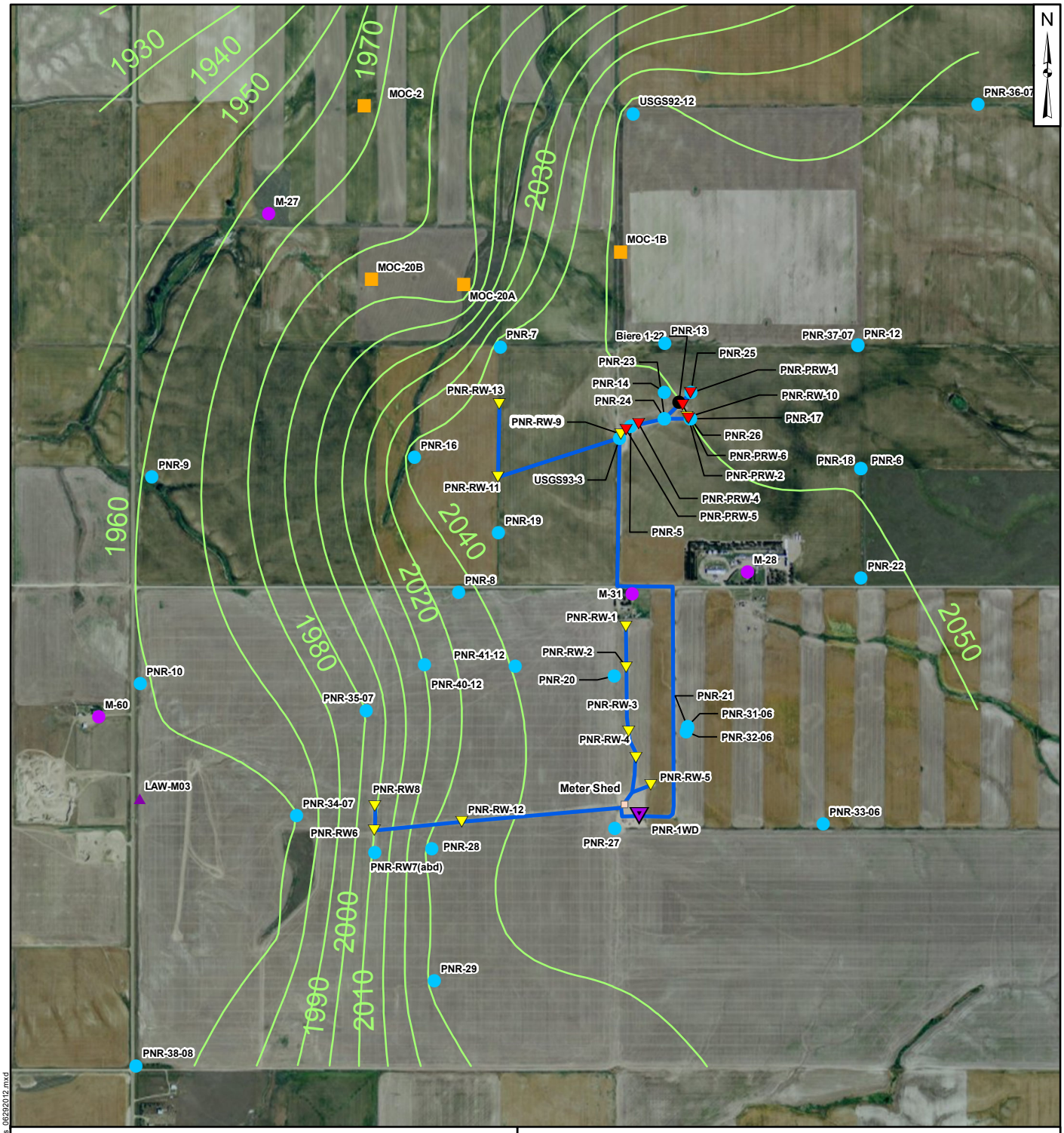
FIGURES



Legend

- Pioneer Monitoring Wells
- Pioneer Ground Water Recovery Wells
- Pioneer Product Recovery Wells
- Private Wells (Monitored by Pioneer)
- Land And Water Wells (LAW-MO3)
- Murphy Oil Company Wells
- Injection Wells
- Former Biere Wells (Producer, Relief & Injections)
- Meter Shed
- Flowlines
- Groundwater Surface Elevation (FT-MSL)

1,500 750 0 1,500 Feet

Well Location and Groundwater Elevation Map
Mesa-Biere 1-22 Groundwater Investigation

Poplar, Montana

Geosyntec consultants

Seattle, Washington | 6/29/2012

Figure 1

Path: P:\GIS\Projects\Pioneer Natural Resources\PNR0522-Poplar\Maps\fig1-GWContours_06292012.mxd

TABLES

Table 1 - Depth to Water and LNAPL in Monitor Wells and Domestic Wells
Pioneer Natural Resources, USA, Inc. - Mesa-Biere #1-22 Groundwater Investigation
Geosyntec Project No.: PNR0522
Last Update: 6/28/2012 - CT - Geosyntec

Well ID	Ground Surface Elev. (ft)	Measure Pt. Elev. (ft)	Gauging Date	Depth to LNAPL (ft bmp)	Depth to Water (ft bmp)	LNAPL Thickness (ft)	Groundwater Elev.* (ft)
LAW-M03	1986.45	1988.90	5/14/2012		29.79		1959.11
M-18	2047.10	2048.13	5/14/2012		79.24		1968.89
M-27	2029.92	2031.19	5/14/2012		66.11		1965.08
M-28	2102.82	2096.63	5/14/2012		48.50		2048.13
M-31	2085.00	2087.17	5/14/2012		41.14		2046.03
M-60	1980.41	1981.44	5/14/2012		22.40		1959.04
MOC-1B	2077.05	2079.51	5/14/2012		26.71		2052.80
MOC-2	2036.10	2038.91	5/14/2012		72.11		1966.80
MOC-3		2010.56	5/14/2012		50.16		1960.40
MOC-4		1966.63	5/14/2012		73.25		1893.38
MOC-20A		1991.89	5/14/2012		12.68		1979.21
MOC-20B		1926.46	5/14/2012		71.61		1854.85
PNR-5	2082.64	2085.56	5/14/2012		37.65		2047.91
PNR-6	2116.53	2119.07	5/14/2012		15.65		2103.42
PNR-7	2069.59	2072.22	5/14/2012		26.11		2046.11
PNR-8	2060.21	2062.99	5/14/2012		62.50		2000.49
PNR-9	2014.11	2017.26	5/14/2012		55.80		1961.46
PNR-10	2009.17	2011.69	5/14/2012		52.42		1959.27
PNR-12	2098.44	2101.23	5/14/2012		48.88		2052.35
PNR-13	2079.38	2081.12	5/14/2012		30.60		2050.52
PNR-14	2079.82	2082.11	5/14/2012		32.38		2049.73
PNR-16	2053.88	2056.80	5/14/2012		11.74		2045.06
PNR-17	2084.06	2086.14	5/14/2012	36.06	36.08	0.02	2050.07
PNR-18	2116.21	2118.16	5/14/2012		67.87		2050.29
PNR-19	2071.26	2073.23	5/14/2012		26.48		2046.75
PNR-20	2084.55	2087.16	5/14/2012		43.51		2043.65
PNR-21	2099.04	2101.59	5/14/2012		59.16		2042.43
PNR-22	2127.38	2129.43	5/14/2012		80.69		2048.74
PNR-23	2083.00	2085.27	5/14/2012		36.41		2048.86
PNR-24	2083.00	2085.68	5/14/2012		36.79		2048.89
PNR-25	2081.92	2084.03	5/14/2012	33.34	33.39	0.05	2050.68
PNR-26	2084.06	2086.15	5/14/2012	35.33	39.35	4.02	2049.61
PNR-27	2092.86	2095.30	5/14/2012		55.50		2039.80
PNR-28	2079.64	2078.44	5/14/2012		45.42		2033.02
PNR-29	2073.76	2072.64	5/14/2012		39.96		2032.68
PNR-31-06	2098.91	2100.98	5/14/2012		58.25		2042.73
PNR-32-06	2098.17	2100.01	5/14/2012		57.60		2042.41
PNR-33-06	2142.86	2144.53	5/14/2012		102.02		2042.51
PNR-34-07	2053.42	2052.14	5/14/2012		92.58		1959.56
PNR-35-08	2060.91	2059.75	5/14/2012		69.71		1990.04
PNR-36-07	2104.80	2107.00	5/14/2012		50.94		2056.06
PNR-37-07	2097.50	2100.50	5/14/2012		48.11		2052.39
PNR-38-08	2038.21	2039.34	5/14/2012		85.59		1953.75
PNR-39-08	2052.80	2055.27	5/14/2012		96.92		1958.35
PNR-40-12	2072.29	2070.07	5/18/2012		11.12		2058.95
PNR-41-12	2075.16	2076.2 [1]	5/18/2012		35.61		2040.59
USGS92-12	2063.92	2065.92	5/14/2012		9.60		2056.32
USGS93-3	2082.10	2083.46	5/14/2012		35.99		2047.47

Notes:
* = Groundwater elevation corrected for LNAPL thickness; Corrected Depth to Water = Depth to Water - .7 x Accum. LNAPL.
All elevations are provided in feet above mean sea level (MSL).
[1] TOC elevation prior to finish below grade
Accronyms/Abbreviations:
ft = feet
ft bmp = feet below measuring point
LNAPL = light non-aqueous phase liquid

Table 2 - Inorganic Water Chemistry Data

Pioneer Natural Resources USA, Inc. - Mesa-Biere #1-22 Groundwater Investigation

Geosyntec Project No.: PNR0522

Last update: 6/28/2012 - CT - Geosyntec

Well No.	Date & Time	Field SC mS	Field Temp. ^{o}C	Field D.O. mg/L	Field pH S.U.	Chloride mg/l	Total Dissolved Solids @ 180^{o} C mg/l
M-27	5/16/2012 17:35	18.6	8.5	0.27	6.42	6760	11000
M-28	5/17/2012 14:20	8.7	9.9	0.94	6.93	1560	5250
M-31	5/18/2012 11:38	72.6	9.6	0.60	6.58	31000	42100
M-60	5/18/2012 11:15	9.2	8.4	0.21	6.97	2860	4600
MOC-1B	5/16/2012 12:37	3.6	9.8	0.98	6.75	59	3610
MOC-2	5/18/2012 9:19	19.3	10.0	0.39	6.79	7080	12800
MOC-3	5/16/2012 15:56	2.9	10.1	1.08	7.40	67	2890
MOC-4	5/17/2012 15:02	9.2	9.5	0.11	6.84	2580	4890
MOC-20A	5/18/2012 8:15	5.8	8.7	0.91	6.00	157	5160
MOC-20B	5/17/2012 12:30	4.7	9.9	0.24	6.21	225	3790
PNR-5	5/16/2012 15:20	11.2	27.8	0.10	8.16	2620	6300
PNR-7	5/18/2012 9:20	66.3	7.0	0.46	mnw	28300	39500
PNR-8	5/18/2012 9:05	7.7	9.9	0.26	6.90	4440	8400
PNR-12	5/16/2012 13:47	4.1	10.1	1.70	6.70	61	4130
PNR-13	5/16/2012 17:25	3.0	10.4	1.20	7.43	106	3430
PNR-14	5/16/2012 14:10	12.8	20.1	0.24	6.69	3110	7510
PNR-19	5/17/2012 11:30	9.8	8.0	3.06	5.56	2230	5260
PNR-20	5/17/2012 14:50	56.1	8.2	0.28	6.30	21900	29800
PNR-21	5/17/2012 15:37	26.7	9.8	0.66	6.62	9290	15100
PNR-22	5/17/2012 13:41	5.3	10.5	0.44	6.74	687	3790
PNR-23	5/17/2012 12:42	8.9	34.3	0.19	mnw	832	4670
PNR-24	5/17/2012 13:18	8.1	30.4	0.21	mnw	1410	4450
PNR-27	5/16/2012 16:50	25.4	8.8	0.29	mnw	8710	15000
PNR-28	5/17/2012 9:32	26.6	8.1	5.15	mnw	9240	17200
PNR-34-07	5/17/2012 16:46	37.4	10.3	0.54	6.51	15200	24900
PNR-38-08	5/18/2012 11:34	19.4	8.6	0.85	mnw	1900	4890
PNR-39-08	5/16/2012 12:39	24.0	10.0	0.82	6.55	9380	17100
PNR-40-12	5/17/2012 11:43	8.0	9.5	3.91	6.81	224	7240
PNR-41-12	5/20/2012 12:00	5.2	8.3	6.18	6.14	910	3230
USGS93-3	5/16/2012 15:07	20.0	19.6	0.14	7.26	6530	10900

Notes:

nm = Not measured

mnw = Meter failure, reading recorded in field notes but not used
or = Over range of meter, SC>2.0 mS

< # = Not detected, number shown is reporting limit

Table 3 - BTEX and TPH Analytical Data
Pioneer Natural Resources USA, Inc. - Mesa-Biere #1-22 Groundwater Investigation
Geosyntec Project No.: PNR0522
Last update: 6/28/2012 - CT - Geosyntec

Well No.	Date & Time	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/l
M-28	5/17/2012 14:20	< 1.0	< 1.0	< 1.0	< 1.0	1
M-31	5/18/2012 11:38	26	< 1.0	< 1.0	< 1.0	< 1
M-60	5/18/2012 11:15	< 1.0	< 1.0	< 1.0	< 1.0	< 1
PNR-7	5/18/2012 9:20	30	< 1.0	< 1.0	< 1.0	< 1
PNR-19	5/17/2012 11:30	0.18 (J)	< 1.0	< 1.0	< 1.0	< 1
PNR-20	5/17/2012 14:50	18	0.33 (J)	< 1.0	< 1.0	< 1
PNR-21	5/17/2012 15:37	< 1.0	< 1.0	< 1.0	< 1.0	< 1
PNR-23	5/17/2012 12:42	0.24 (J)	0.25 (J)	< 1.0	0.27 (J)	< 1
PNR-24	5/17/2012 13:18	0.31 (J)	0.27 (J)	5.6	7.2	2
Trip Blank1 Lot040512 B-TS SHP0255	5/15/2012 15:01	< 1.0	< 1.0	< 1.0	< 1.0	nm
Trip Blank2 Lot040512 B-TS SHP0255	5/15/2012 10:40	< 1.0	< 1.0	< 1.0	< 1.0	nm
Trip Blank #2 Lot 050212 B-TS SHP0255	5/18/2012 8:15	< 1.0	< 1.0	< 1.0	< 1.0	nm
Trip Blank #3 Lot 050212 B-TS SHP0255	5/17/2012 14:50	< 1.0	< 1.0	< 1.0	< 1.0	nm
Trip Blank #4 Lot 050212 B-TS SHP0255	5/17/2012 14:20	< 1.0	< 1.0	< 1.0	< 1.0	nm
Trip Blank #5 Lot 050212 B-TS SHP0255	5/17/2012 11:30	< 1.0	< 1.0	< 1.0	< 1.0	nm
Equip Blank	5/18/2012 14:25	< 1.0	< 1.0	< 1.0	< 1.0	nm

Notes:

< # = Analyte not detected, number shown is reporting limit

J = Estimated value. Present but less than the limit of quantitation.

H = Analysis performed past recommended holding time.

nm = Not measured.

T = This target analyte was found in the associated trip blank as well as the sample.

Table 4 - Brine Recovery Wells - Chloride and BTEX Analytical Data
Pioneer Natural Resources USA, Inc. - Mesa-Biere #1-22 Groundwater Investigation
Geosyntec Project No.: PNR0522
Last update: 6/28/2012 - CT - Geosyntec

Well No.	Date & Time	Chloride mg/l	TDS mg/l	Ph S.U.	Specific Conductance @ 25° C mS/cm	Benzene µg/l	Toluene µg/l	Ethylbenzene µg/l	Total Xylenes µg/l	Total Petroleum Hydrocarbons mg/L
PNR-RW-1	1/9/2008 14:33	28000	nm	nm	71.2	19.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-1	10/5/2009 15:10	25600	nm	nm	55.4	19.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-1	4/14/2010 10:00	25400	nm	6.9	52.9	17.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-1	9/17/2010 13:35	22600	nm	nm	54.1	17.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-1	9/22/2011 10:05	17900	nm	6.5	49.4	11.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-1	5/15/2012 15:19	15400	25400	6.9	40.2	8.2	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-2	1/9/2008 12:20	22400	nm	nm	59.7	13.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	4/22/2009 19:20	17500	nm	nm	48.5	14.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	10/5/2009 15:20	22900	nm	nm	50.4	16.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	4/14/2010 10:30	22400	nm	6.9	47.9	15.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	9/17/2010 14:00	18500	nm	nm	45.6	15.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	9/22/2011 10:25	15600	nm	6.5	44.2	10.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-2	5/15/2012 15:01	14900	24800	6.9	38.9	9.3	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-3	1/8/2008 16:08	31800	nm	nm	76.8	23.0	< 0.50	< 0.50	0.49 (J)	nm
PNR-RW-3	4/22/2009 19:05	22000	nm	nm	58.5	12.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	10/14/2009 14:10	31200	nm	nm	nm	16.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	4/16/2010 9:20	36400	nm	6.7	67.9	18.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	9/17/2010 14:10	11200	nm	nm	29.4	18.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	5/6/2011 11:45	24100	nm	6.8	52.8	12.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	9/22/2011 10:40	21100	nm	6.8	52.8	9.9	< 0.50	< 0.50	< 0.50	nm
PNR-RW-3	5/15/2012 14:29	16800	28900	6.8	43.8	7.1	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-4	1/8/2008 14:10	24400	nm	nm	63.6	20.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	4/22/2009 18:55	19700	nm	nm	53.6	14.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	10/5/2009 15:30	23500	nm	nm	50.3	11.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	4/14/2010 11:00	21500	nm	6.9	46.8	8.6	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	9/17/2010 14:20	14700	nm	nm	37.9	5.9	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	5/6/2011 13:54	12700	nm	7.0	30.9	2.7	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	9/22/2011 11:20	11400	nm	6.6	33.6	2.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-4	5/15/2012 13:20	9200	15500	6.9	27.4	1.7	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-5	1/8/2008 11:47	15000	nm	nm	42.4	5.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	4/22/2009 18:40	15800	nm	nm	44.0	6.2	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	10/5/2009 15:45	18000	nm	nm	41.7	5.4	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	4/14/2010 11:15	15200	nm	6.8	36.6	4.7	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	9/17/2010 14:30	12300	nm	nm	32.4	3.5	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	5/6/2011 14:09	10900	nm	6.8	10.9	2.2	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	9/22/2011 11:35	9120	nm	6.6	28.7	2.4	< 0.50	< 0.50	< 0.50	nm
PNR-RW-5	5/15/2012 13:44	8020	13100	6.8	23.8	2.0	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-6	4/22/2009 17:00	18800	nm	nm	50.7	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	4/19/2010 14:40	21500	nm	6.8	46.4	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	9/17/2010 14:45	19200	nm	nm	46.2	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	5/6/2011 11:20	18600	nm	6.8	40.5	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	9/22/2011 13:30	13800	nm	6.4	39.5	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	12/28/2011 14:55	11700	nm	6.7	34.8	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-6	5/15/2012 10:57	10800	19900	6.9	30.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-7A	4/22/2009 17:15	17900	nm	nm	47.0	< 0.50	0.61	< 0.50	< 0.50	nm
PNR-RW-7A	10/5/2009 14:15	20400	nm	nm	47.5	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-7A	4/16/2010 10:30	23100	nm	6.8	45.3	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-7A	9/22/2010 16:00	17700	nm	nm	42.5	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-8	4/22/2009 16:45	18900	nm	nm	50.3	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-8	10/5/2009 14:30	23300	nm	nm	49.9	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-8	4/19/2010 14:10	22700	nm	6.9	50.1	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-8	12/28/2011 14:30	11400	nm	6.6	34.5	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-8	5/15/2012 10:40	10100	18300	6.8	29.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-9	4/22/2009 17:45	21800	nm	nm	58.6	1.9	< 0.50	5.1	0.99	nm
PNR-RW-9	10/14/2009 14:10	13900	nm	nm	nm	1.4	< 0.50	8.5	3.3	nm
PNR-RW-9	4/14/2010 12:05	16900	nm	7.1	41.8	0.91	< 0.50	6.9	6.6	nm
PNR-RW-9	9/17/2010 15:20	12300	nm	nm	33.3	0.91	< 0.50	8.2	3.5	nm
PNR-RW-9	5/6/2011 14:25	9350	nm	7.3	25.8	0.65	< 0.50	4.7	1.5	nm
PNR-RW-9	9/23/2011 11:30	8650	nm	6.8	26.9	0.46	< 0.50	2.5	1.3	nm
PNR-RW-9	5/15/2012 11:42	6350	11300	7.3	19.5	0.2 (J)	< 1.0	2.3	0.28 (J)	1
PNR-RW-10	4/22/2009 18:00	871	nm	nm	6.8	13.0	42	19	49	nm
PNR-RW-10	10/5/2009 14:50	914	nm	nm	6.7	12.0	62	30	96	nm
PNR-RW-10	4/14/2010 11:50	641	nm	8.5	5.9	10.0	39	23	61	nm
PNR-RW-10	9/21/2010 10:00	315	nm	nm	4.9	39.0	139	78	212	nm
PNR-RW-10	5/6/2011 14:42	436	nm	8.0	5.0	6.8	28	33	69	nm
PNR-RW-10	5/15/2012 14:07	343	3260	7.9	9.7	6.3	22	44	59	50
PNR-RW-11	10/1/2009 10:45	36700	nm	nm	82.6	12.0	< 0.50	< 0.50	< 0.50	nm
PNR-RW-11	4/15/2010 10:00	31900	nm	6.9	63.0	9.1	< 0.50	< 0.50	< 0.50	nm
PNR-RW-11	9/17/2010 15:10	24700	nm	nm	58.3	9.9	< 0.50	< 0.50	< 0.50	nm
PNR-RW-11	5/6/2011 14:55	20300	nm	7.0	47.5	8.3	< 0.50	< 0.50	< 0.50	nm
PNR-RW-11	9/23/2011 11:13	19100	nm	6.6	52.3	8.9	< 0.50	< 0.50	< 0.50	nm
PNR-RW-11	5/15/2012 15:55	17000	24900	6.9	44.2	7.5	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-12	4/19/2010 15:05	22000	nm	6.8	47.4	0.70	< 0.50	< 0.50	< 0.50	nm
PNR-RW-12	9/17/2010 14:55	19200	nm	nm	47.1	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-12	5/6/2011 11:35	18900	nm	6.8	42.9	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-12	9/22/2011 13:45	14500	nm	6.5	42.7	< 0.50	< 0.50	< 0.50	< 0.50	nm
PNR-RW-12	5/15/2012 11:20	14100	27300	6.9	37.4	0.40 (J)	< 1.0	< 1.0	< 1.0	< 1
PNR-RW-13	5/20/2012 14:30	19900	29400	mnw	54.6	5.50	< 1.0	< 1.0	< 1.0	< 1

Notes

< # = Analyte not detected, number shown is reporting limit

J = Estimated value. Present but less than the limit of quantitation.

nm = Not measured.

mnw = Meter failure, reading recorded in field notes but not used

APPENDIX A

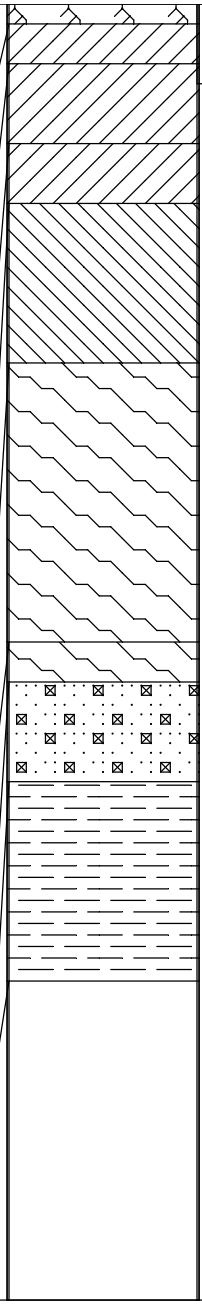
Borehole Logs and Well Construction Diagrams

Project No. PNR0522	LOG OF WELL PNR-40-12	Sheet 1 of 1

Project Name: Mesa-Biere1-22 Groundwater Investigation
Client: Pioneer Natural Resources Inc.
Project Location: Poplar, MT
Borehole Location: 48° 9'19.48"N 105° 8'16.48"W

Date Started: May 16,2012
Date Finished: May 16, 2012
Logged By: C.Tyrrell
Approved By: B. Miller

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	Well Construction	ADDITIONAL DATA
		Surface Elevation: 2072.3 feet			
0	2070	(0.0 feet) Topsoil, sandy clay (CL), medium brown, common organics.			- Monitoring well recessed within well vault. - 6 inch Certa-lok SDR-21 solid PVC casing to 29 feet. - 3/8 inch bentonite chip seal from surface to 21 feet.
5	2065	(1.0 feet) Lean clay with sand (CL), dark brown, percent of fine grained sand increases with depth.			
10	2060	(3.0 feet) Sandy lean clay (CL), medium brown, moist, stiffness increases with depth, sand primarily fine grained, scattered subangular gravels up to 1/4 inch from 5.0 feet to 7.0 feet.			
15	2055	(7.0 feet) Sandy lean clay (CL), medium brown, moist, stiff, sand primarily fine grained, 20% red-brown to yellow-brown gravel ranging from 1/4 inch to 2-1/2 inches in diameter.			
20	2050	(10.0 feet) Sandy lean to fat clay (CL-CH), medium brown, stiff, sand primarily fine grained, 20% red-brown to yellow-brown gravel ranging from 1/4 inch to 2-1/2 inches in diameter, iron staining from 16.0 feet to 18.0 feet.			- 10-20 mesh silica sand filter pack from 21 to 49 feet.
25	2045				
30	2040	(18.0 feet) Sandy fat clay (CH), medium brown, plastic, sand primarily fine grained decreasing with depth, 20% red-brown to yellow-brown subangular gravel ranging from 1/4 inch to 2-1/2 inches in diameter, sandy from 30.0 to 32.0 feet.			- 0.020 inch PVC SDR-21 screen from 29 to 49 feet.
35	2035				
40	2030	(32.0 feet) Sandy fat clay (CH), yellow-brown, plastic, less sand than above, fine grained gravel throughout, bituminous coal fragments present.			
45	2025	(34.0 feet) Poorly graded gravel with sand (GP), red-brown to yellow-brown, subrounded to round gravel up to 2.0 inches in diameter, bituminous coal fragments present.			
50	2020	(39.0 feet) Bearpaw Shale (Kb), dark gray, platy.			- Total depth of well is 49 feet below ground surface.
55	2015	(49.0 feet) Boring terminated at 49 feet below ground surface in Bearpaw Shale. Static water level measured on May 18, 2012, at 11.12 feet below ground surface.			
60	2010				
65					



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Telephone: (206) 496-1450
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Drilling Method: Air Rotary
Drill Rig: Maytlon HD-44
Contractor: Ron Askin Drilling
Operator: D. Askin

Project No. PNR0522	LOG OF WELL PNR-41-12	Sheet 1 of 1

Project Name: Mesa-Biere1-22 Groundwater Investigation
Client: Pioneer Natural Resources Inc.
Project Location: Poplar, MT
Borehole Location: 48° 9'19.37"N 105° 8'1.86"W

Date Started: May 18,2012
Date Finished: May 18, 2012
Logged By: C. Leibli and C. Tyrrell
Approved By: B. Miller

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	Well Construction	ADDITIONAL DATA
0	2075	Surface Elevation: 2075.2 feet			
		(0.0 feet) Topsoil, sandy clay (CL), medium brown, common organics.			- Monitoring well recessed within well vault. - 4.5 inch Certa-lok SDR-17 solid PVC casing to 38 feet. - 3/8 inch bentonite chip seal from surface to 11 feet.
5	2070	(1.0 feet) Lean clay with sand (CL), dark brown, percent of fine grained sand increases with depth.			
10	2065	(3.0 feet) Sandy lean clay (CL), medium brown, moist, medium to high plasticity, sand primarily fine grained, bituminous coal fragments present.			- Natural cuttings (borehole collapse) from 11 to 38 feet.
15	2060	(7.0 feet) Sandy lean to fat clay (CL-CH), medium brown, moist, scattered red-brown to yellow-brown gravel up to 1 inch in diameter.			
20	2055				
		(10.0 feet) Sandy fat clay (CH), medium brown, moist, sand primarily fine grained, scattered red-brown to yellow-brown gravel ranging up to 1 inch in diameter, iron staining.			
25	2050				
30	2045				
35	2040	(34.0 feet) Sandy fat clay (CH), grayish brown, moist, sand primarily fine grained, scattered red-brown to yellow-brown gravel ranging up to 2 inches in diameter.			- 0.025 inch PVC SDR-17 screen from 38 to 58 feet. - 10-20 mesh silica sand filter pack from 38 to 58 feet.
40	2035				
45	2030	(45.0 feet) Poorly graded gravel with sand (GP), red-brown to yellow-brown, subrounded to round gravel up to 1 inch in diameter, bituminous coal fragments present.			- Borehole 14 inch diameter 0-45 feet, 10 inch diameter 45-58 feet.
50	2025	(48.0 feet) Bearpaw Shale (Kb), dark gray, platy.			
55	2020				
60	2015	(58.0 feet) Boring terminated at 58 feet below ground surface in Bearpaw Shale. Static water level measured on May 20, 2012, at 35.61 feet below ground surface.			- Total depth of well is 58 feet below ground surface.
65					

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1201 Third Avenue,Suite 330
Seattle, Washington 98101
Telephone: (206) 496-1450
www.geosyntec.com

Drilling Method: Air Rotary
Drill Rig: Maytlon HD-44
Contractor: Ron Askin Drilling
Operator: D. Askin

Project No. PNR0522	LOG OF WELL PNR-RW-13	Sheet 1 of 1

Project Name: Mesa-Biere1-22 Groundwater Investigation
Client: Pioneer Natural Resources Inc.
Project Location: Poplar, MT
Borehole Location: 48° 9'47.64"N 105° 8'04.49"W

Date Started: May 17, 2012
Date Finished: May 17, 2012
Logged By: C.Tyrrell
Approved By: B. Miller

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	Well Construction	ADDITIONAL DATA
		Surface Elevation: 2071.2 feet			
0	2070	(0.0 feet) Topsoil, silty sand (SM), medium brown, common organics.			- Monitoring well recessed within well vault. - 6 inch Certa-lok SDR-21 solid PVC casing to 34 feet. - 3/8 inch bentonite chip seal from surface to 30 feet.
5	2065	(1.0 feet) Lean clay with sand (CL), medium brown, slightly moist, stiff, sand primarily fine grained, scattered subangular gravel up to 1/2 inch in diameter, cobble encountered from 2 feet to 3 feet below ground surface.			
10	2060	(11.0 feet) Lean to fat clay with sand (CL-CH), medium brown, slightly moist, stiff, scattered subangular gravel up to 1 inch in diameter, iron staining.			
15	2055				
20	2050	(17.0 feet) Lean to fat clay (CL-CH), medium grayish brown, moist, scattered subangular to subrounded gravel ranging from 1/4 inch to 1-1/2 inches in diameter, iron staining, coal fragments present, cobble 12 inches in diameter encountered from 22 feet to 23 feet.			
25	2045				
30	2040				- 10-20 mesh silica sand filter pack from 30 to 54 feet.
35	2035	(35.0 feet) Poorly graded gravel with silt and sand (GP-GM), red-brown to yellow-brown, 50-60% subrounded to round gravel up to 3 inches in diameter, poorly sorted, scattered cobbles.			- 0.020 inch PVC SDR-21 screen from 34 to 54 feet. - Borehole 14 inch diameter 0-35 feet, 10 inch diameter 35-54 feet.
40	2030				
45	2025	(44.0 feet) Bearpaw Shale (Kb), dark gray, platy.			
50	2020				
55	2015	(54.0 feet) Boring terminated at 54 feet below ground surface in Bearpaw Shale. Static water level measured on May 20, 2012, at 26.39 feet below ground surface.			- Total depth of well is 54 feet below ground surface.
60	2010				
65					

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Drilling Method: Air Rotary
Drill Rig: Maytlon HD-44
Contractor: Ron Askin Drilling
Operator: D. Askin

Project No. PNR0522	LOG OF WELL PNR-PRW-5	Sheet 1 of 1

Project Name: Mesa-Biere1-22 Groundwater Investigation
Client: Pioneer Natural Resources Inc.
Project Location: Poplar, MT
Borehole Location: 48° 9'44.88"N 105° 7'44.05"W

Date Started: May 22, 2012
Date Finished: May 22, 2012
Logged By: C.Tyrrell
Approved By: B. Miller

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	Well Construction	ADDITIONAL DATA
		Surface Elevation: 2082.1 feet			
0	2080	(0.0 feet) Topsoil, lean clay with sand (CL), medium brown, common organics, petroleum staining and odor.			- Monitoring well recessed within well vault. - 4.5 inch Certa-lok SDR-17 solid PVC casing to 27 feet. - 3/8 inch bentonite chip seal from surface to 21 feet.
5	2075	(1.0 feet) Lean clay with sand (CL), medium brown, slightly moist, sand primarily fine grained, scattered subangular gravel up to 1/4 inch in diameter.			
10	2070	(3.0 feet) Sandy lean clay (CL), medium brown, sand primarily fine grained, scattered subangular gravel up to 1 inch in diameter, petroleum staining.			
15	2065				
20	2060	(6.0 feet) Fat clay with sand (CH), grayish brown, moist, sand predominately fine grained, scattered subangular gravel up to 1/4 inch in diameter,iron staining, petroleum smearing and odor.			- 10-20 mesh silica sand filter pack from 21 to 47 feet.
25	2055	(10.0 feet) Fat clay with sand (CH), medium brown, moist, stiff, sand predominately fine grained, scattered subangular to subrounded gravel ranging from 1/4 inch to 3-1/2 inch in diameter, iron staining down to 20 feet, petroleum smearing and odor at bottom of interval from 26 feet to 26.5 feet.			- 0.025 inch PVC SDR-17 screen from 27 to 47 feet.
30	2050				
35	2045	(26.5 feet) Poorly graded sand with gravel (SP), medium brown, moist, sand predominantly medium grained, subangular to subrounded gravel up to 1/2 inch in diameter, iron staining, petroleum staining and odor.			
40	2040	(29.0 feet) Poorly graded gravel and sand (GP-SP), medium brown, moist, sand predominantly medium grained, 50-60% subrounded to round red-brown to yellow-brown gravel up to 1-1/2 inches in diameter, petroleum staining.			
45	2035				- Natural cuttings from 47 to 50 feet.
50	2030	(33.0 feet) Poorly graded gravel with sand (GP), red-brown to yellow-brown, 70-80% subrounded to round gravel up to 1-1/2 inches in diamteter, poorly sorted, petroleum staining from 32 feet to 33 feet.			- Total depth of well is 47 feet below ground surface.
55	2025	(50.0 feet) Boring terminated at 50.0 feet below ground surface in Wiota Gravels/glacial alluvium.			
60	2020	Fluid levels measured on May 31, 2012: LNAPL - no measureable product Groundwater - 34.16 feet (below ground surface).			
65					

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Drilling Method: Air Rotary
Drill Rig: Maytlon HD-44
Contractor: Ron Askin Drilling
Operator: D. Askin

Project No. PNR0522	LOG OF WELL PNR-PRW-6	Sheet 1 of 1

Project Name: Mesa-Biere1-22 Groundwater Investigation
Client: Pioneer Natural Resources Inc.
Project Location: Poplar, MT
Borehole Location: 48° 9'47.52"N 105° 7'34.96"W

Date Started: May 17, 2012
Date Finished: May 18, 2012
Logged By: C.Tyrrell and C. Leibli
Approved By: B. Miller

Surface Elevation: 2082.3 feet

Depth (ft)	Elevation (ft)	MATERIAL DESCRIPTION	GRAPHIC LOG	Well Construction	ADDITIONAL DATA
0	2080	(0.0 feet) Topsoil, lean clay with sand (CL), medium brown, common organics.			- Monitoring well recessed within well vault. - 4.5 inch Certa-lok SDR-17 solid PVC casing to 25 feet. - 3/8 inch bentonite chip seal from surface to 15 feet.
5	2075	(1.0 feet) Lean clay with sand (CL), medium brown, sand primarily fine grained, scattered subangular gravel up to 1/2 inch in diameter.			
10	2070	(3.0 feet) Sandy lean to fat clay (CL-CH), light gray to grayish brown, sand primarily fine grained, scattered subangular gravel up to 1 inch in diameter, high bentonite content.			
15	2065	(7.0 feet) Fat clay with sand (CH), brown to black, slightly moist, stiff, sand predominately fine grained, scattered subangular to subrounded gravel up to 1-1/2 inch in diameter, petroleum smearing and odor throughout interval and highly concentrated from 29-30 feet, cobbles up to 12 inches in diameter encountered from 8-9 feet and 23-24 feet.			- 10-20 mesh silica sand filter pack from 15 to 47 feet.
20	2060				
25	2055				- 0.025 inch PVC SDR-17 screen from 25 to 45 feet.
30	2050	(30.0 feet) Poorly graded sand with gravel (SP), medium brown, moist, sand predominantly medium grained, 30% subangular to subrounded gravel up to 1/2 inch in diameter, petroleum staining and strong odor.			
35	2045	(35.0 feet) Poorly graded gravel and sand (GP-SP), medium brown to black, moist, sand predominantly medium grained, 50-60% subrounded to round red-brown to yellow-brown gravel up to 1 inch in diameter, petroleum staining and strong odor.			
40	2040				
45	2035	(40.0 feet) Poorly graded gravel with sand (GP), red-brown to yellow-brown, 70-80% subrounded to round gravel up to 1-1/2 inches in diamteter, poorly sorted.			- Total depth of well is 45 feet below ground surface.
50	2030	(47.0 feet) Boring terminated at 47.0 feet below ground surface in Wiota Gravels/glacial alluvium.			
55	2025	Fluid levels measured on May 31, 2012: LNAPL - 32.36 feet Groundwater - 34.89 feet (below ground surface).			
60	2020				
65					

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Drilling Method: Air Rotary
Drill Rig: Maytlon HD-44
Contractor: Ron Askin Drilling
Operator: D. Askin

APPENDIX B
Analytical Results

ANALYTICAL SUMMARY REPORT

May 31, 2012

Geosyntec Consultants
55 SW Yamhill St Ste 200
Portland, OR 97204-3338

Workorder No.: B12051534

Project Name: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A

Energy Laboratories Inc Billings MT received the following 14 samples for Geosyntec Consultants on 5/16/2012 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B12051534-001	PNR-RW-8	05/15/12 10:40	05/16/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12051534-002	PNR-RW-6	05/15/12 10:57	05/16/12	Aqueous	Same As Above
B12051534-003	PNR-RW-12	05/15/12 11:20	05/16/12	Aqueous	Same As Above
B12051534-004	PNR-RW-9	05/15/12 11:42	05/16/12	Aqueous	Same As Above
B12051534-005	PNR-RW-4	05/15/12 13:20	05/16/12	Aqueous	Same As Above
B12051534-006	PNR-RW-5	05/15/12 13:44	05/16/12	Aqueous	Same As Above
B12051534-007	PNR-RW-10	05/15/12 14:07	05/16/12	Aqueous	Same As Above
B12051534-008	PNR-RW-3	05/15/12 14:29	05/16/12	Aqueous	Same As Above
B12051534-009	PNR-RW-2	05/15/12 15:01	05/16/12	Aqueous	Same As Above
B12051534-010	PNR-RW-1	05/15/12 15:19	05/16/12	Aqueous	Same As Above
B12051534-011	PNR-RW-11	05/15/12 15:55	05/16/12	Aqueous	Same As Above
B12051534-012	PNR-RW-11 Dup	05/15/12 15:55	05/16/12	Aqueous	Same As Above
B12051534-013	Trip Blank1 Lot040512 B-TS SHP0255	05/15/12 15:01	05/16/12	Trip Blank	8260-Volatile Organic Compounds-BTEX
B12051534-014	Trip Blank2 Lot040512 B-TS SHP0255	05/15/12 10:40	05/16/12	Trip Blank	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on an as received basis unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0
Sample Delivery Group: B12051534

Report Date: 05/31/12

CASE NARRATIVE

Tests associated with analyst identified as ELI-G were subcontracted to Energy Laboratories, 400 W Boxelder Rd, Gillette, WY, EPA Number WY00006.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-001
Client Sample ID PNR-RW-8

Report Date: 05/31/12
Collection Date: 05/15/12 10:40
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	18300	mg/L		10		A2540 C	05/17/12 15:37 / ser
INORGANICS							
Chloride	10100	mg/L	D	50		E300.0	05/18/12 02:03 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 12:16 / nl
Surr: 1,2-Dichloroethane-d4	110	%REC		70-130		SW8260B	05/18/12 12:16 / nl
Surr: Dibromofluoromethane	101	%REC		77-126		SW8260B	05/18/12 12:16 / nl
Surr: p-Bromofluorobenzene	118	%REC		76-127		SW8260B	05/18/12 12:16 / nl
Surr: Toluene-d8	96.0	%REC		79-122		SW8260B	05/18/12 12:16 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:33 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-002
Client Sample ID PNR-RW-6

Report Date: 05/31/12
Collection Date: 05/15/12 10:57
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	19900	mg/L		10		A2540 C	05/17/12 15:37 / ser
INORGANICS							
Chloride	10800	mg/L	D	50		E300.0	05/18/12 02:15 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 12:46 / nl
Surr: 1,2-Dichloroethane-d4	112	%REC		70-130		SW8260B	05/18/12 12:46 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/18/12 12:46 / nl
Surr: p-Bromofluorobenzene	115	%REC		76-127		SW8260B	05/18/12 12:46 / nl
Surr: Toluene-d8	97.0	%REC		79-122		SW8260B	05/18/12 12:46 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:24 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-003
Client Sample ID PNR-RW-12

Report Date: 05/31/12
Collection Date: 05/15/12 11:20
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	27300	mg/L		10		A2540 C	05/17/12 15:37 / ser
INORGANICS							
Chloride	14100	mg/L	D	50		E300.0	05/18/12 02:26 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	0.40	ug/L	J	1.0		SW8260B	05/18/12 13:15 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 13:15 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 13:15 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 13:15 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 13:15 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 13:15 / nl
Surr: 1,2-Dichloroethane-d4	115	%REC		70-130		SW8260B	05/18/12 13:15 / nl
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	05/18/12 13:15 / nl
Surr: p-Bromofluorobenzene	118	%REC		76-127		SW8260B	05/18/12 13:15 / nl
Surr: Toluene-d8	98.0	%REC		79-122		SW8260B	05/18/12 13:15 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:33 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-004
Client Sample ID PNR-RW-9

Report Date: 05/31/12
Collection Date: 05/15/12 11:42
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	11300	mg/L		10		A2540 C	05/17/12 15:37 / ser
INORGANICS							
Chloride	6350	mg/L	D	20		E300.0	05/18/12 02:37 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	0.20	ug/L	J	1.0		SW8260B	05/18/12 11:48 / nl
Ethylbenzene	2.3	ug/L		1.0		SW8260B	05/18/12 11:48 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 11:48 / nl
m+p-Xylenes	0.28	ug/L	J	1.0		SW8260B	05/18/12 11:48 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 11:48 / nl
Xylenes, Total	0.28	ug/L	J	1.0		SW8260B	05/18/12 11:48 / nl
Surr: 1,2-Dichloroethane-d4	111	%REC		70-130		SW8260B	05/18/12 11:48 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/18/12 11:48 / nl
Surr: p-Bromofluorobenzene	112	%REC		76-127		SW8260B	05/18/12 11:48 / nl
Surr: Toluene-d8	97.0	%REC		79-122		SW8260B	05/18/12 11:48 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	1	mg/L		1		E1664A	05/22/12 16:55 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-005
Client Sample ID PNR-RW-4

Report Date: 05/31/12
Collection Date: 05/15/12 13:20
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	15500	mg/L		10		A2540 C	05/17/12 15:37 / ser
INORGANICS							
Chloride	9200	mg/L	D	50		E300.0	05/18/12 02:48 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	1.7	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 13:44 / nl
Surr: 1,2-Dichloroethane-d4	113	%REC		70-130		SW8260B	05/18/12 13:44 / nl
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	05/18/12 13:44 / nl
Surr: p-Bromofluorobenzene	117	%REC		76-127		SW8260B	05/18/12 13:44 / nl
Surr: Toluene-d8	96.0	%REC		79-122		SW8260B	05/18/12 13:44 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:32 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-006
Client Sample ID PNR-RW-5

Report Date: 05/31/12
Collection Date: 05/15/12 13:44
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	13100	mg/L		10		A2540 C	05/17/12 15:38 / ser
INORGANICS							
Chloride	8020	mg/L	D	20		E300.0	05/18/12 02:59 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	2.0	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 14:14 / nl
Surr: 1,2-Dichloroethane-d4	111	%REC		70-130		SW8260B	05/18/12 14:14 / nl
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	05/18/12 14:14 / nl
Surr: p-Bromofluorobenzene	116	%REC		76-127		SW8260B	05/18/12 14:14 / nl
Surr: Toluene-d8	99.0	%REC		79-122		SW8260B	05/18/12 14:14 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:31 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-007
Client Sample ID PNR-RW-10

Report Date: 05/31/12
Collection Date: 05/15/12 14:07
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3260	mg/L		10		A2540 C	05/17/12 15:52 / ser
INORGANICS							
Chloride	343	mg/L	D	5		E300.0	05/18/12 03:10 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	6.3	ug/L		1.0		SW8260B	05/18/12 18:37 / nl
Ethylbenzene	44	ug/L		2.5		SW8260B	05/19/12 14:56 / nl
Toluene	22	ug/L		2.5		SW8260B	05/19/12 14:56 / nl
m+p-Xylenes	46	ug/L		2.5		SW8260B	05/19/12 14:56 / nl
o-Xylene	12	ug/L		2.5		SW8260B	05/19/12 14:56 / nl
Xylenes, Total	59	ug/L		2.5		SW8260B	05/19/12 14:56 / nl
Surr: 1,2-Dichloroethane-d4	110	%REC		70-130		SW8260B	05/18/12 18:37 / nl
Surr: Dibromofluoromethane	104	%REC		77-126		SW8260B	05/18/12 18:37 / nl
Surr: p-Bromofluorobenzene	110	%REC		76-127		SW8260B	05/18/12 18:37 / nl
Surr: Toluene-d8	100	%REC		79-122		SW8260B	05/18/12 18:37 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	50	mg/L		1		E1664A	05/22/12 16:33 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-008
Client Sample ID PNR-RW-3

Report Date: 05/31/12
Collection Date: 05/15/12 14:29
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	28900	mg/L		10		A2540 C	05/17/12 15:52 / ser
INORGANICS							
Chloride	16800	mg/L	D	50		E300.0	05/18/12 03:21 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	7.1	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 18:07 / nl
Surr: 1,2-Dichloroethane-d4	116	%REC		70-130		SW8260B	05/18/12 18:07 / nl
Surr: Dibromofluoromethane	103	%REC		77-126		SW8260B	05/18/12 18:07 / nl
Surr: p-Bromofluorobenzene	115	%REC		76-127		SW8260B	05/18/12 18:07 / nl
Surr: Toluene-d8	98.0	%REC		79-122		SW8260B	05/18/12 18:07 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:32 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-009
Client Sample ID PNR-RW-2

Report Date: 05/31/12
Collection Date: 05/15/12 15:01
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	24800	mg/L		10		A2540 C	05/17/12 15:52 / ser
INORGANICS							
Chloride	14900	mg/L	D	50		E300.0	05/18/12 03:55 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	9.3	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 17:39 / nl
Surr: 1,2-Dichloroethane-d4	113	%REC		70-130		SW8260B	05/18/12 17:39 / nl
Surr: Dibromofluoromethane	101	%REC		77-126		SW8260B	05/18/12 17:39 / nl
Surr: p-Bromofluorobenzene	118	%REC		76-127		SW8260B	05/18/12 17:39 / nl
Surr: Toluene-d8	96.0	%REC		79-122		SW8260B	05/18/12 17:39 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:24 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-010
Client Sample ID PNR-RW-1

Report Date: 05/31/12
Collection Date: 05/15/12 15:19
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	25400	mg/L		10		A2540 C	05/17/12 15:53 / ser
INORGANICS							
Chloride	15400	mg/L	D	50		E300.0	05/18/12 04:28 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	8.2	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 17:09 / nl
Surr: 1,2-Dichloroethane-d4	114	%REC		70-130		SW8260B	05/18/12 17:09 / nl
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	05/18/12 17:09 / nl
Surr: p-Bromofluorobenzene	118	%REC		76-127		SW8260B	05/18/12 17:09 / nl
Surr: Toluene-d8	98.0	%REC		79-122		SW8260B	05/18/12 17:09 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:23 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-011
Client Sample ID PNR-RW-11

Report Date: 05/31/12
Collection Date: 05/15/12 15:55
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	24900	mg/L		10		A2540 C	05/17/12 15:53 / ser
INORGANICS							
Chloride	17000	mg/L	D	50		E300.0	05/18/12 04:39 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	7.5	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 16:41 / nl
Surr: 1,2-Dichloroethane-d4	116	%REC		70-130		SW8260B	05/18/12 16:41 / nl
Surr: Dibromofluoromethane	104	%REC		77-126		SW8260B	05/18/12 16:41 / nl
Surr: p-Bromofluorobenzene	120	%REC		76-127		SW8260B	05/18/12 16:41 / nl
Surr: Toluene-d8	97.0	%REC		79-122		SW8260B	05/18/12 16:41 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:33 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-012
Client Sample ID PNR-RW-11 Dup

Report Date: 05/31/12
Collection Date: 05/15/12 15:55
DateReceived: 05/16/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	27800	mg/L		10		A2540 C	05/17/12 15:53 / ser
INORGANICS							
Chloride	17200	mg/L	D	50		E300.0	05/18/12 04:50 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	7.4	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 16:11 / nl
Surr: 1,2-Dichloroethane-d4	116	%REC		70-130		SW8260B	05/18/12 16:11 / nl
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	05/18/12 16:11 / nl
Surr: p-Bromofluorobenzene	120	%REC		76-127		SW8260B	05/18/12 16:11 / nl
Surr: Toluene-d8	96.0	%REC		79-122		SW8260B	05/18/12 16:11 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/22/12 15:30 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-013
Client Sample ID Trip Blank1 Lot040512 B-TS SHP0255

Report Date: 05/31/12
Collection Date: 05/15/12 15:01
DateReceived: 05/16/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 10:19 / nl
Surr: 1,2-Dichloroethane-d4	103	%REC		70-130		SW8260B	05/18/12 10:19 / nl
Surr: Dibromofluoromethane	99.0	%REC		77-126		SW8260B	05/18/12 10:19 / nl
Surr: p-Bromofluorobenzene	114	%REC		76-127		SW8260B	05/18/12 10:19 / nl
Surr: Toluene-d8	100	%REC		79-122		SW8260B	05/18/12 10:19 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A
Lab ID: B12051534-014
Client Sample ID Trip Blank2 Lot040512 B-TS SHP0255

Report Date: 05/31/12
Collection Date: 05/15/12 10:40
DateReceived: 05/16/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/18/12 09:50 / nl
Surr: 1,2-Dichloroethane-d4	104	%REC		70-130		SW8260B	05/18/12 09:50 / nl
Surr: Dibromofluoromethane	99.0	%REC		77-126		SW8260B	05/18/12 09:50 / nl
Surr: p-Bromofluorobenzene	113	%REC		76-127		SW8260B	05/18/12 09:50 / nl
Surr: Toluene-d8	99.0	%REC		79-122		SW8260B	05/18/12 09:50 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS120517B
Sample ID: MBLK6	Method Blank				Run: BAL #11_120517C				05/17/12 15:51
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS6	Laboratory Control Sample				Run: BAL #11_120517C				05/17/12 15:51
Solids, Total Dissolved TDS @ 180 C	1990	mg/L	10	100	90	110			
Sample ID: B12051559-001A MS	Sample Matrix Spike				Run: BAL #11_120517C				05/17/12 15:52
Solids, Total Dissolved TDS @ 180 C	2410	mg/L	10	99	90	110			
Sample ID: B12051541-001A DUP	Sample Duplicate				Run: BAL #11_120517C				05/17/12 15:52
Solids, Total Dissolved TDS @ 180 C	3530	mg/L	10		90	110	0.7	5	
Sample ID: MBLK5	Method Blank				Run: BAL #11_120517C				05/17/12 15:34
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS5	Laboratory Control Sample				Run: BAL #11_120517C				05/17/12 15:34
Solids, Total Dissolved TDS @ 180 C	2000	mg/L	10	100	90	110			
Sample ID: B12051533-003A MS	Sample Matrix Spike				Run: BAL #11_120517C				05/17/12 15:34
Solids, Total Dissolved TDS @ 180 C	2250	mg/L	10	99	90	110			
Sample ID: B12051533-014A DUP	Sample Duplicate				Run: BAL #11_120517C				05/17/12 15:37
Solids, Total Dissolved TDS @ 180 C	1880	mg/L	10		90	110	0.0	5	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1664A									Batch: G_TPH120522A
Sample ID: MBLK1205220807	Method Blank				Run: SUB-G194844				05/22/12 13:06
Total Petroleum Hydrocarbons	ND	mg/L	0.4						
Sample ID: LCS1205220807	Laboratory Control Sample				Run: SUB-G194844				05/22/12 13:07
Total Petroleum Hydrocarbons	16	mg/L	5.0	78	64	132			
Sample ID: LCSD1205220807	Laboratory Control Sample Duplicate				Run: SUB-G194844				05/22/12 13:08
Total Petroleum Hydrocarbons	16	mg/L	5.0	81	64	132	2.5	34	
Sample ID: G12050413-001FMS	Sample Matrix Spike				Run: SUB-G194844				05/22/12 13:10
Total Petroleum Hydrocarbons	16	mg/L	5.0	79	64	132			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0								Analytical Run: IC203-B_120517A	
Sample ID: ICV051712-11	Initial Calibration Verification Standard							05/17/12 11:42	
Chloride	23.3	mg/L	1.0	93	90	110			
Method: E300.0								Batch: R185434	
Sample ID: ICB051712-12	Method Blank				Run: IC203-B_120517A			05/17/12 11:53	
Chloride	ND	mg/L	0.2						
Sample ID: LFB051712-13	Laboratory Fortified Blank				Run: IC203-B_120517A			05/17/12 12:04	
Chloride	23.5	mg/L	1.0	94	90	110			
Sample ID: B12051533-014AMS	Sample Matrix Spike				Run: IC203-B_120517A			05/18/12 01:30	
Chloride	335	mg/L	2.6	98	90	110			
Sample ID: B12051533-014AMSD	Sample Matrix Spike Duplicate				Run: IC203-B_120517A			05/18/12 01:41	
Chloride	335	mg/L	2.6	98	90	110	0.1	20	
Sample ID: B12051534-009AMS	Sample Matrix Spike				Run: IC203-B_120517A			05/18/12 04:06	
Chloride	19800	mg/L	53	99	90	110			
Sample ID: B12051534-009AMSD	Sample Matrix Spike Duplicate				Run: IC203-B_120517A			05/18/12 04:17	
Chloride	19800	mg/L	53	99	90	110	0.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/31/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185430
Sample ID: CCV051812	Continuing Calibration Verification Standard								05/18/12 07:47
Benzene	5.28	ug/L	1.0	106	70	130			
Ethylbenzene	4.84	ug/L	1.0	97	80	120			
Toluene	4.92	ug/L	1.0	98	80	120			
m+p-Xylenes	9.84	ug/L	1.0	98	70	130			
o-Xylene	4.84	ug/L	1.0	97	70	130			
Xylenes, Total	14.7	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	107	60	136			
Surr: Dibromofluoromethane			1.0	100	70	132			
Surr: p-Bromofluorobenzene			1.0	110	78	160			
Surr: Toluene-d8			1.0	97	75	138			
Method: SW8260B									Batch: R185430
Sample ID: LCS051812	Laboratory Control Sample				Run: SV5972.I_120518A				05/18/12 08:23
Benzene	5.36	ug/L	1.0	107	71	133			
Ethylbenzene	4.96	ug/L	1.0	99	78	131			
Toluene	5.20	ug/L	1.0	104	78	134			
m+p-Xylenes	10.0	ug/L	1.0	100	78	133			
o-Xylene	4.92	ug/L	1.0	98	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	107	70	130			
Surr: Dibromofluoromethane			1.0	99	77	126			
Surr: p-Bromofluorobenzene			1.0	108	76	127			
Surr: Toluene-d8			1.0	98	79	122			
Sample ID: BLK051812	Method Blank				Run: SV5972.I_120518A				05/18/12 09:21
Benzene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	104	70	130			
Surr: Dibromofluoromethane			1.0	98	77	126			
Surr: p-Bromofluorobenzene			1.0	114	76	127			
Surr: Toluene-d8			1.0	100	79	122			
Sample ID: B12051534-001Cms	Sample Matrix Spike				Run: SV5972.I_120518A				05/18/12 14:43
Benzene	5.36	ug/L	1.0	107	71	133			
Ethylbenzene	4.80	ug/L	1.0	96	78	131			
Toluene	5.12	ug/L	1.0	102	78	134			
m+p-Xylenes	9.88	ug/L	1.0	99	78	133			
o-Xylene	4.84	ug/L	1.0	97	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	112	70	130			
Surr: Dibromofluoromethane			1.0	100	77	126			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/31/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R185430
Sample ID: B12051534-001Cms	Sample Matrix Spike				Run: SV5972.I_120518A				05/18/12 14:43
Surr: p-Bromofluorobenzene			1.0	113	76	127			
Surr: Toluene-d8			1.0	97	79	122			
Sample ID: B12051534-001Cmsd	Sample Matrix Spike Duplicate				Run: SV5972.I_120518A				05/18/12 15:12
Benzene	5.28	ug/L	1.0	106	71	133	1.5	20	
Ethylbenzene	4.52	ug/L	1.0	90	78	131	6.0	20	
Toluene	4.92	ug/L	1.0	98	78	134	4.0	20	
m+p-Xylenes	9.20	ug/L	1.0	92	78	133	7.1	20	
o-Xylene	4.64	ug/L	1.0	93	79	136	4.2	20	
Surr: 1,2-Dichloroethane-d4			1.0	112	70	130			
Surr: Dibromofluoromethane			1.0	101	77	126			
Surr: p-Bromofluorobenzene			1.0	114	76	127			
Surr: Toluene-d8			1.0	97	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/31/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-01A **Work Order:** B12051534

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185484
Sample ID: CCV051912	Continuing Calibration Verification Standard								05/19/12 13:30
Ethylbenzene	5.04	ug/L	1.0	101	80	120			
Toluene	5.40	ug/L	1.0	108	80	120			
m+p-Xylenes	10.4	ug/L	1.0	104	70	130			
o-Xylene	5.08	ug/L	1.0	102	70	130			
Xylenes, Total	15.4	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	110	60	136			
Surr: Dibromofluoromethane			1.0	102	70	132			
Surr: p-Bromofluorobenzene			1.0	112	78	160			
Surr: Toluene-d8			1.0	100	75	138			
Method: SW8260B									Batch: R185484
Sample ID: LCS051912	Laboratory Control Sample				Run: SV5972.I_120519A				05/19/12 13:59
Ethylbenzene	5.00	ug/L	1.0	100	78	131			
Toluene	5.32	ug/L	1.0	106	78	134			
m+p-Xylenes	10.3	ug/L	1.0	103	78	133			
o-Xylene	5.00	ug/L	1.0	100	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	104	70	130			
Surr: Dibromofluoromethane			1.0	100	77	126			
Surr: p-Bromofluorobenzene			1.0	110	76	127			
Surr: Toluene-d8			1.0	101	79	122			
Sample ID: BLK051912	Method Blank				Run: SV5972.I_120519A				05/19/12 14:27
Ethylbenzene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	103	70	130			
Surr: Dibromofluoromethane			1.0	99	77	126			
Surr: p-Bromofluorobenzene			1.0	113	76	127			
Surr: Toluene-d8			1.0	98	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Workorder Receipt Checklist

B12051534

Geosyntec Consultants

Login completed by: Genoa R. Carver
Date Received: 5/16/2012
Reviewed by: BL2000\jklier
Received by: lg
Reviewed Date: 5/17/2012
Carrier name: Return-UPS Ground

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Container/Temp Blank temperature:	℃ See Comments		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

Trip Blank 3 received broken.

Temp Blank temperature for Cooler 1 was 2.8℃, Cooler 2 was 1.6℃.and Cooler 3 was 2.6℃. All coolers contained ice.

Sample 8: Chain of Custody states PNR-RW-3, all containers state PNR-RW-11. Sample collection time is the same on Chain of Custody and container labels @1429. A phone message was left 5/16/12 for Christa Tyrrell regarding sample identification discrepancy.

Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc. Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-01A	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) CM
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order:

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

- ☐ DW
- ☐ GSA
- ☐ POTW/WWTP
- ☐ State: ______
- ☐ Other: ______
- ☐ A2LA
- ☐ EDD/EDT (Electronic Data) Format: ______
- ☐ LEVEL IV
- ☐ NELAC

Number of Containers; Sample Type: A W S V B O — Air Water Soils/Solids Vegetation Bioassay Other

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments: Cooler #1 2.8° Cooler #2 1.6° Cooler #3 2.6°

Shipped by: Ryan UPS Grd
Cooler ID(s):
Receipt Temp: See notes °C
On Ice: (Yes) No
Custody Seal (Y) N
Intact (Y) N
Signature Match (Y) N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH	SEE ATTACHED	Normal Turnaround (TAT)	RUSH	LABORATORY USE ONLY
2	1 PNR-RW-8	5/15/12	1040	W	X	X		X		B12051534-001
2	2 PNR-RW-6	↓	1057	↓	↓	↓		↓		-002
2	3 PNR-RW-12	↓	1120	↓	↓	↓		↓		-003
2	4 PNR-RW-9	↓	1142	↓	↓	↓		↓		-004
3	5 PNR-RW-4	↓	1320	↓	↓	↓		↓		-005
3	6 PNR-RW-5	↓	1344	↓	↓	↓		↓		-006
3	7 PNR-RW-10	↓	1407	↓	↓	↓		↓		-007
3	8 PNR-RW-3	↓	1429	↓	↓	↓		↓		-008
1	9 PNR-RW-2	↓	1501	↓	↓	↓		↓		-009
1	10 PNR-RW-1	↓	1519	↓	↓	↓		↓		-010

Custody Record MUST be Signed

Relinquished by (print): Cook Murch	Date/Time: 5/15/12 1730	Signature: Cook R. Murch	Received by (print): UPS	Date/Time:	Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client: ____	Lab Disposal: X		Received by Laboratory:	Date/Time: 5-16-12 905	Signature: [signature]

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report. Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc. Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-01A	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) CM
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order:

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ A2LA
☐ GSA ☐ EDD/EDT(Electronic Data)
☐ POTW/WWTP Format:_____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH	SEE ATTACHED	Normal Turnaround (TAT)	RUSH	
1 PNR-RW-11	5/15/12	1555	W	X	X		x		B12051534-011
2 PNR-RW-11 Dup	〃	1555	W	X	X				-012
3									
TB1 4-5-12-B TS SHP0255									-013
5 TB2 4-5-12-B TS SHP0255									-014
6 TB3 Reed broken									
7									
8									
9									
10									

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:
Cooler #1 2.8°
Cooler #2 1.6°
Cooler #3 2.6°

Shipped by: FEDEX UPS (TR)
Cooler ID(s):
Receipt Temp: See Notes C
On Ice: (Yes) No
Custody Seal Intact Signature Match: (Y) N

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Cook Mueck	Date/Time: 5/15/12 1730	Signature: Cook Mueck	Received by (print): UPS	Date/Time: Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print):	Date/Time: Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: X			Received by Laboratory:	Date/Time: 5-16-12 9:05 Signature: Lisa Stanley

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested. This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

ANALYTICAL SUMMARY REPORT

June 04, 2012

Geosyntec Consultants
55 SW Yamhill St Ste 200
Portland, OR 97204-3338

Workorder No.: B12051861

Project Name: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A

Energy Laboratories Inc Billings MT received the following 37 samples for Geosyntec Consultants on 5/21/2012 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B12051861-001	MOC-1B	05/16/12 12:37	05/21/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved
B12051861-002	PNR-12	05/16/12 13:47	05/21/12	Aqueous	Same As Above
B12051861-003	MOC-3	05/16/12 15:56	05/21/12	Aqueous	Same As Above
B12051861-004	PNR-13	05/16/12 17:25	05/21/12	Aqueous	Same As Above
B12051861-005	MOC-20B	05/17/12 12:30	05/21/12	Aqueous	Same As Above
B12051861-006	MOC-20B-DUP	05/17/12 12:30	05/21/12	Aqueous	Same As Above
B12051861-007	PNR-22	05/17/12 13:41	05/21/12	Aqueous	Same As Above
B12051861-008	MOC-4	05/17/12 15:02	05/21/12	Aqueous	Same As Above
B12051861-009	MOC-20A	05/18/12 8:15	05/21/12	Aqueous	Same As Above
B12051861-010	PNR-8	05/18/12 9:05	05/21/12	Aqueous	Same As Above
B12051861-011	M-60	05/18/12 11:15	05/21/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12051861-012	M-60-DUP	05/18/12 11:15	05/21/12	Aqueous	Same As Above
B12051861-013	Equip Blank	05/18/12 14:25	05/21/12	Aqueous	8260-Volatile Organic Compounds-BTEX
B12051861-014	PNR-39-08	05/16/12 12:39	05/21/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved
B12051861-015	USGS-93-3	05/16/12 15:07	05/21/12	Aqueous	Same As Above
B12051861-016	PNR-40-12	05/17/12 11:43	05/21/12	Aqueous	Same As Above
B12051861-017	M-28	05/17/12 14:20	05/21/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12051861-018	PNR-21	05/17/12 15:37	05/21/12	Aqueous	Same As Above
B12051861-019	PNR-34-07	05/17/12 16:46	05/21/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved
B12051861-020	MOC-2	05/18/12 9:19	05/21/12	Aqueous	Same As Above

ANALYTICAL SUMMARY REPORT

B12051861-021	M-31	05/18/12 11:38	05/21/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12051861-022	PNR-14	05/16/12 14:10	05/21/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved
B12051861-023	PNR-5	05/16/12 15:20	05/21/12	Aqueous	Same As Above
B12051861-024	PNR-27	05/16/12 16:50	05/21/12	Aqueous	Same As Above
B12051861-025	M-27	05/16/12 17:35	05/21/12	Aqueous	Same As Above
B12051861-026	PNR-28	05/17/12 9:32	05/21/12	Aqueous	Same As Above
B12051861-027	PNR-28-DUP	05/17/12 9:45	05/21/12	Aqueous	Same As Above
B12051861-028	PNR-19	05/17/12 11:30	05/21/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12051861-029	PNR-23	05/17/12 12:42	05/21/12	Aqueous	Same As Above
B12051861-030	PNR-24	05/17/12 13:18	05/21/12	Aqueous	Same As Above
B12051861-031	PNR-20	05/17/12 14:50	05/21/12	Aqueous	Same As Above
B12051861-032	PNR-7	05/18/12 9:20	05/21/12	Aqueous	Same As Above
B12051861-033	PNR-38-08	05/18/12 11:34	05/21/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved
B12051861-034	Trip Blank #2 Lot 050212 B-TS SHP0255	05/18/12 8:15	05/21/12	Trip Blank	8260-Volatile Organic Compounds-BTEX
B12051861-035	Trip Blank #3 Lot 050212 B-TS SHP0255	05/17/12 14:50	05/21/12	Trip Blank	Same As Above
B12051861-036	Trip Blank #4 Lot 050212 B-TS SHP0255	05/17/12 14:20	05/21/12	Trip Blank	Same As Above
B12051861-037	Trip Blank #5 Lot 050212 B-TS SHP0255	05/17/12 11:30	05/21/12	Trip Blank	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on an as received basis unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0
Sample Delivery Group: B12051861

Report Date: 06/04/12

CASE NARRATIVE

Tests associated with analyst identified as ELI-G were subcontracted to Energy Laboratories, 400 W Boxelder Rd, Gillette, WY, EPA Number WY00006.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-001
Client Sample ID MOC-1B

Report Date: 06/04/12
Collection Date: 05/16/12 12:37
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3610	mg/L		10		A2540 C	05/21/12 11:53 / ser
INORGANICS							
Chloride	59	mg/L	D	5		E300.0	05/22/12 00:54 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-002
Client Sample ID PNR-12

Report Date: 06/04/12
Collection Date: 05/16/12 13:47
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4130	mg/L		10		A2540 C	05/21/12 11:53 / ser
INORGANICS							
Chloride	61	mg/L	D	5		E300.0	05/22/12 01:05 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-003
Client Sample ID MOC-3

Report Date: 06/04/12
Collection Date: 05/16/12 15:56
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	2890	mg/L		10		A2540 C	05/21/12 11:53 / ser
INORGANICS							
Chloride	67	mg/L	D	5		E300.0	05/22/12 01:39 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-004
Client Sample ID PNR-13

Report Date: 06/04/12
Collection Date: 05/16/12 17:25
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3430	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	106	mg/L	D	5		E300.0	05/22/12 02:12 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-005
Client Sample ID MOC-20B

Report Date: 06/04/12
Collection Date: 05/17/12 12:30
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3790	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	225	mg/L	D	5		E300.0	05/22/12 02:23 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-006
Client Sample ID MOC-20B-DUP

Report Date: 06/04/12
Collection Date: 05/17/12 12:30
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3780	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	224	mg/L	D	5		E300.0	05/22/12 02:34 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-007
Client Sample ID PNR-22

Report Date: 06/04/12
Collection Date: 05/17/12 13:41
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3790	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	687	mg/L	D	5		E300.0	05/22/12 02:45 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-008
Client Sample ID MOC-4

Report Date: 06/04/12
Collection Date: 05/17/12 15:02
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4890	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	2580	mg/L	D	10		E300.0	05/22/12 02:56 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-009
Client Sample ID MOC-20A

Report Date: 06/04/12
Collection Date: 05/18/12 08:15
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	5160	mg/L		10		A2540 C	05/21/12 11:54 / ser
INORGANICS							
Chloride	157	mg/L	D	5		E300.0	05/22/12 03:08 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-010
Client Sample ID PNR-8

Report Date: 06/04/12
Collection Date: 05/18/12 09:05
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	8400	mg/L		10		A2540 C	05/21/12 11:55 / ser
INORGANICS							
Chloride	4440	mg/L	D	20		E300.0	05/22/12 03:19 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-011
Client Sample ID M-60

Report Date: 06/04/12
Collection Date: 05/18/12 11:15
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4600	mg/L		10		A2540 C	05/21/12 11:57 / ser
INORGANICS							
Chloride	2860	mg/L	D	10		E300.0	05/22/12 03:30 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 17:39 / nl
Surr: 1,2-Dichloroethane-d4	108	%REC		70-130		SW8260B	05/23/12 17:39 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/23/12 17:39 / nl
Surr: p-Bromofluorobenzene	114	%REC		76-127		SW8260B	05/23/12 17:39 / nl
Surr: Toluene-d8	106	%REC		79-122		SW8260B	05/23/12 17:39 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 14:24 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-012
Client Sample ID M-60-DUP

Report Date: 06/04/12
Collection Date: 05/18/12 11:15
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	5140	mg/L		10		A2540 C	05/21/12 11:57 / ser
INORGANICS							
Chloride	2860	mg/L	D	10		E300.0	05/22/12 03:41 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 18:07 / nl
Surr: 1,2-Dichloroethane-d4	104	%REC		70-130		SW8260B	05/23/12 18:07 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/23/12 18:07 / nl
Surr: p-Bromofluorobenzene	114	%REC		76-127		SW8260B	05/23/12 18:07 / nl
Surr: Toluene-d8	108	%REC		79-122		SW8260B	05/23/12 18:07 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 15:04 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-013
Client Sample ID Equip Blank

Report Date: 06/04/12
Collection Date: 05/18/12 14:25
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 18:36 / nl
Surr: 1,2-Dichloroethane-d4	97.0	%REC		70-130		SW8260B	05/23/12 18:36 / nl
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	05/23/12 18:36 / nl
Surr: p-Bromofluorobenzene	127	%REC		76-127		SW8260B	05/23/12 18:36 / nl
Surr: Toluene-d8	107	%REC		79-122		SW8260B	05/23/12 18:36 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-014
Client Sample ID PNR-39-08

Report Date: 06/04/12
Collection Date: 05/16/12 12:39
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	17100	mg/L		10		A2540 C	05/22/12 12:06 / ser
INORGANICS							
Chloride	9380	mg/L	D	20		E300.0	05/22/12 04:14 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-015
Client Sample ID USGS-93-3

Report Date: 06/04/12
Collection Date: 05/16/12 15:07
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	10900	mg/L		10		A2540 C	05/22/12 12:05 / ser
INORGANICS							
Chloride	6530	mg/L	D	20		E300.0	05/22/12 04:48 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-016
Client Sample ID PNR-40-12

Report Date: 06/04/12
Collection Date: 05/17/12 11:43
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	7240	mg/L		10		A2540 C	05/21/12 11:57 / ser
INORGANICS							
Chloride	224	mg/L	D	10		E300.0	05/22/12 04:59 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-017
Client Sample ID M-28

Report Date: 06/04/12
Collection Date: 05/17/12 14:20
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	5250	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	1560	mg/L	D	10		E300.0	05/22/12 05:10 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 19:04 / nl
Surr: 1,2-Dichloroethane-d4	99.0	%REC		70-130		SW8260B	05/23/12 19:04 / nl
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	05/23/12 19:04 / nl
Surr: p-Bromofluorobenzene	111	%REC		76-127		SW8260B	05/23/12 19:04 / nl
Surr: Toluene-d8	108	%REC		79-122		SW8260B	05/23/12 19:04 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	1	mg/L		1		E1664A	05/23/12 15:51 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-018
Client Sample ID PNR-21

Report Date: 06/04/12
Collection Date: 05/17/12 15:37
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	15100	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	9290	mg/L	D	50		E300.0	05/22/12 05:21 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
Ethylbenzene	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
Toluene	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
m+p-Xylenes	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
o-Xylene	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
Xylenes, Total	ND	ug/L		2.5		SW8260B	05/24/12 13:33 / nl
Surr: 1,2-Dichloroethane-d4	97.0	%REC		70-130		SW8260B	05/24/12 13:33 / nl
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	05/24/12 13:33 / nl
Surr: p-Bromofluorobenzene	106	%REC		76-127		SW8260B	05/24/12 13:33 / nl
Surr: Toluene-d8	110	%REC		79-122		SW8260B	05/24/12 13:33 / nl
- The reporting limit reflects a 5 times dilution. The sample was diluted due to foaming.							
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 15:08 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-019
Client Sample ID PNR-34-07

Report Date: 06/04/12
Collection Date: 05/17/12 16:46
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	24900	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	15200	mg/L	D	50		E300.0	05/22/12 05:32 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-020
Client Sample ID MOC-2

Report Date: 06/04/12
Collection Date: 05/18/12 09:19
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	12800	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	7080	mg/L	D	20		E300.0	05/22/12 05:43 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-021
Client Sample ID M-31

Report Date: 06/04/12
Collection Date: 05/18/12 11:38
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	42100	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	31000	mg/L	D	100		E300.0	05/22/12 05:54 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	26	ug/L		2.5		SW8260B	05/23/12 15:16 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 21:57 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 21:57 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 21:57 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 21:57 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 21:57 / nl
Surr: 1,2-Dichloroethane-d4	123	%REC		70-130		SW8260B	05/23/12 21:57 / nl
Surr: Dibromofluoromethane	110	%REC		77-126		SW8260B	05/23/12 21:57 / nl
Surr: p-Bromofluorobenzene	120	%REC		76-127		SW8260B	05/23/12 21:57 / nl
Surr: Toluene-d8	102	%REC		79-122		SW8260B	05/23/12 21:57 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 14:27 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-022
Client Sample ID PNR-14

Report Date: 06/04/12
Collection Date: 05/16/12 14:10
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	7510	mg/L		10		A2540 C	05/21/12 11:58 / ser
INORGANICS							
Chloride	3110	mg/L	D	10		E300.0	05/22/12 06:05 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-023
Client Sample ID PNR-5

Report Date: 06/04/12
Collection Date: 05/16/12 15:20
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	6300	mg/L		10		A2540 C	05/21/12 11:59 / ser
INORGANICS							
Chloride	2620	mg/L	D	10		E300.0	05/22/12 06:16 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-024
Client Sample ID PNR-27

Report Date: 06/04/12
Collection Date: 05/16/12 16:50
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	15000	mg/L		10		A2540 C	05/21/12 11:59 / ser
INORGANICS							
Chloride	8710	mg/L	D	20		E300.0	05/22/12 06:50 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-025
Client Sample ID M-27

Report Date: 06/04/12
Collection Date: 05/16/12 17:35
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	11000	mg/L		10		A2540 C	05/21/12 11:59 / ser
INORGANICS							
Chloride	6760	mg/L	D	20		E300.0	05/22/12 07:23 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-026
Client Sample ID PNR-28

Report Date: 06/04/12
Collection Date: 05/17/12 09:32
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	17200	mg/L		10		A2540 C	05/21/12 12:00 / ser
INORGANICS							
Chloride	9240	mg/L	D	20		E300.0	05/22/12 07:34 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-027
Client Sample ID PNR-28-DUP

Report Date: 06/04/12
Collection Date: 05/17/12 09:45
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	16800	mg/L		10		A2540 C	05/21/12 12:00 / ser
INORGANICS							
Chloride	9160	mg/L	D	20		E300.0	05/22/12 07:45 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-028
Client Sample ID PNR-19

Report Date: 06/04/12
Collection Date: 05/17/12 11:30
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	5260	mg/L		10		A2540 C	05/21/12 12:00 / ser
INORGANICS							
Chloride	2230	mg/L	D	10		E300.0	05/22/12 07:56 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	0.18	ug/L	J	1.0		SW8260B	05/23/12 19:33 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 19:33 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 19:33 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 19:33 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 19:33 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 19:33 / nl
Surr: 1,2-Dichloroethane-d4	98.0	%REC		70-130		SW8260B	05/23/12 19:33 / nl
Surr: Dibromofluoromethane	99.0	%REC		77-126		SW8260B	05/23/12 19:33 / nl
Surr: p-Bromofluorobenzene	113	%REC		76-127		SW8260B	05/23/12 19:33 / nl
Surr: Toluene-d8	106	%REC		79-122		SW8260B	05/23/12 19:33 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 14:21 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-029
Client Sample ID PNR-23

Report Date: 06/04/12
Collection Date: 05/17/12 12:42
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4670	mg/L		10		A2540 C	05/21/12 12:00 / ser
INORGANICS							
Chloride	832	mg/L	D	10		E300.0	05/22/12 08:08 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	0.24	ug/L	J	1.0		SW8260B	05/23/12 20:30 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 20:30 / nl
Toluene	0.25	ug/L	J	1.0		SW8260B	05/23/12 20:30 / nl
m+p-Xylenes	0.27	ug/L	J	1.0		SW8260B	05/23/12 20:30 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 20:30 / nl
Xylenes, Total	0.27	ug/L	J	1.0		SW8260B	05/23/12 20:30 / nl
Surr: 1,2-Dichloroethane-d4	99.0	%REC		70-130		SW8260B	05/23/12 20:30 / nl
Surr: Dibromofluoromethane	97.0	%REC		77-126		SW8260B	05/23/12 20:30 / nl
Surr: p-Bromofluorobenzene	113	%REC		76-127		SW8260B	05/23/12 20:30 / nl
Surr: Toluene-d8	109	%REC		79-122		SW8260B	05/23/12 20:30 / nl
- The sample was received in the laboratory with a pH > 2. The pH was 3.							
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 15:03 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-030
Client Sample ID PNR-24

Report Date: 06/04/12
Collection Date: 05/17/12 13:18
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4450	mg/L		10		A2540 C	05/21/12 12:01 / ser
INORGANICS							
Chloride	1410	mg/L	D	10		E300.0	05/22/12 08:19 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	0.31	ug/L	J	1.0		SW8260B	05/23/12 20:59 / nl
Ethylbenzene	5.6	ug/L		1.0		SW8260B	05/23/12 20:59 / nl
Toluene	0.27	ug/L	J	1.0		SW8260B	05/23/12 20:59 / nl
m+p-Xylenes	4.7	ug/L		1.0		SW8260B	05/23/12 20:59 / nl
o-Xylene	2.5	ug/L		1.0		SW8260B	05/23/12 20:59 / nl
Xylenes, Total	7.2	ug/L		1.0		SW8260B	05/23/12 20:59 / nl
Surr: 1,2-Dichloroethane-d4	107	%REC		70-130		SW8260B	05/23/12 20:59 / nl
Surr: Dibromofluoromethane	105	%REC		77-126		SW8260B	05/23/12 20:59 / nl
Surr: p-Bromofluorobenzene	111	%REC		76-127		SW8260B	05/23/12 20:59 / nl
Surr: Toluene-d8	105	%REC		79-122		SW8260B	05/23/12 20:59 / nl
- The sample was received in the laboratory with a pH > 2. The pH was 6.							
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	2	mg/L		1		E1664A	05/23/12 15:08 / eli-g

Report Definitions:

RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-031
Client Sample ID PNR-20

Report Date: 06/04/12
Collection Date: 05/17/12 14:50
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	29800	mg/L		10		A2540 C	05/22/12 12:05 / ser
INORGANICS							
Chloride	21900	mg/L	D	100		E300.0	05/22/12 17:29 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	18	ug/L		1.0		SW8260B	05/23/12 20:02 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 20:02 / nl
Toluene	0.33	ug/L	J	1.0		SW8260B	05/23/12 20:02 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 20:02 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 20:02 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 20:02 / nl
Surr: 1,2-Dichloroethane-d4	115	%REC		70-130		SW8260B	05/23/12 20:02 / nl
Surr: Dibromofluoromethane	105	%REC		77-126		SW8260B	05/23/12 20:02 / nl
Surr: p-Bromofluorobenzene	118	%REC		76-127		SW8260B	05/23/12 20:02 / nl
Surr: Toluene-d8	106	%REC		79-122		SW8260B	05/23/12 20:02 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 14:23 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.
J - Estimated value. The analyte was present but less than th reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-032
Client Sample ID PNR-7

Report Date: 06/04/12
Collection Date: 05/18/12 09:20
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	39500	mg/L		10		A2540 C	05/22/12 12:05 / ser
INORGANICS							
Chloride	28300	mg/L	D	100		E300.0	05/22/12 08:46 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	30	ug/L		2.5		SW8260B	05/23/12 13:22 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/23/12 21:28 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/23/12 21:28 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/23/12 21:28 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/23/12 21:28 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/23/12 21:28 / nl
Surr: 1,2-Dichloroethane-d4	120	%REC		70-130		SW8260B	05/23/12 21:28 / nl
Surr: Dibromofluoromethane	109	%REC		77-126		SW8260B	05/23/12 21:28 / nl
Surr: p-Bromofluorobenzene	120	%REC		76-127		SW8260B	05/23/12 21:28 / nl
Surr: Toluene-d8	103	%REC		79-122		SW8260B	05/23/12 21:28 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/23/12 14:24 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-033
Client Sample ID PNR-38-08

Report Date: 06/04/12
Collection Date: 05/18/12 11:34
DateReceived: 05/21/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	4890	mg/L		10		A2540 C	05/22/12 12:06 / ser
INORGANICS							
Chloride	1900	mg/L	D	10		E300.0	05/22/12 08:58 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-034
Client Sample ID Trip Blank #2 Lot 050212 B-TS SHP0255

Report Date: 06/04/12
Collection Date: 05/18/12 08:15
DateReceived: 05/21/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/22/12 17:23 / nl
Surr: 1,2-Dichloroethane-d4	99.0	%REC		70-130		SW8260B	05/22/12 17:23 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/22/12 17:23 / nl
Surr: p-Bromofluorobenzene	113	%REC		76-127		SW8260B	05/22/12 17:23 / nl
Surr: Toluene-d8	107	%REC		79-122		SW8260B	05/22/12 17:23 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-035
Client Sample ID Trip Blank #3 Lot 050212 B-TS SHP0255

Report Date: 06/04/12
Collection Date: 05/17/12 14:50
DateReceived: 05/21/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/24/12 11:38 / nl
Surr: 1,2-Dichloroethane-d4	96.0	%REC		70-130		SW8260B	05/24/12 11:38 / nl
Surr: Dibromofluoromethane	98.0	%REC		77-126		SW8260B	05/24/12 11:38 / nl
Surr: p-Bromofluorobenzene	103	%REC		76-127		SW8260B	05/24/12 11:38 / nl
Surr: Toluene-d8	114	%REC		79-122		SW8260B	05/24/12 11:38 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-036
Client Sample ID Trip Blank #4 Lot 050212 B-TS SHP0255

Report Date: 06/04/12
Collection Date: 05/17/12 14:20
DateReceived: 05/21/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/24/12 12:06 / nl
Surr: 1,2-Dichloroethane-d4	96.0	%REC		70-130		SW8260B	05/24/12 12:06 / nl
Surr: Dibromofluoromethane	100	%REC		77-126		SW8260B	05/24/12 12:06 / nl
Surr: p-Bromofluorobenzene	102	%REC		76-127		SW8260B	05/24/12 12:06 / nl
Surr: Toluene-d8	111	%REC		79-122		SW8260B	05/24/12 12:06 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12051861-037
Client Sample ID Trip Blank #5 Lot 050212 B-TS SHP0255

Report Date: 06/04/12
Collection Date: 05/17/12 11:30
DateReceived: 05/21/12
Matrix: Trip Blank

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
VOLATILE ORGANIC COMPOUNDS							
Benzene	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/24/12 12:35 / nl
Surr: 1,2-Dichloroethane-d4	98.0	%REC		70-130		SW8260B	05/24/12 12:35 / nl
Surr: Dibromofluoromethane	99.0	%REC		77-126		SW8260B	05/24/12 12:35 / nl
Surr: p-Bromofluorobenzene	104	%REC		76-127		SW8260B	05/24/12 12:35 / nl
Surr: Toluene-d8	113	%REC		79-122		SW8260B	05/24/12 12:35 / nl

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS120521B
Sample ID: MBLK4	Method Blank				Run: BAL #11_120521C				05/21/12 11:51
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS4	Laboratory Control Sample				Run: BAL #11_120521C				05/21/12 11:51
Solids, Total Dissolved TDS @ 180 C	1960	mg/L	10	98	90	110			
Sample ID: B12051774-005A MS	Sample Matrix Spike				Run: BAL #11_120521C				05/21/12 11:52
Solids, Total Dissolved TDS @ 180 C	2390	mg/L	10	98	90	110			
Sample ID: B12051782-001A DUP	Sample Duplicate				Run: BAL #11_120521C				05/21/12 11:52
Solids, Total Dissolved TDS @ 180 C	43.6	mg/L	10		90	110	0.9	5	
Sample ID: B12051861-003A DUP	Sample Duplicate				Run: BAL #11_120521C				05/21/12 11:54
Solids, Total Dissolved TDS @ 180 C	2900	mg/L	10		90	110	0.3	5	
Sample ID: MBLK5	Method Blank				Run: BAL #11_120521C				05/21/12 11:56
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS5	Laboratory Control Sample				Run: BAL #11_120521C				05/21/12 11:57
Solids, Total Dissolved TDS @ 180 C	2030	mg/L	10	101	90	110			
Sample ID: B12051861-012A DUP	Sample Duplicate				Run: BAL #11_120521C				05/21/12 11:57
Solids, Total Dissolved TDS @ 180 C	5240	mg/L	10		90	110	1.9	5	
Sample ID: B12051861-023A DUP	Sample Duplicate				Run: BAL #11_120521C				05/21/12 11:59
Solids, Total Dissolved TDS @ 180 C	6390	mg/L	10		90	110	1.3	5	
Sample ID: B12051643-008A MS	Sample Matrix Spike				Run: BAL #11_120521C				05/21/12 12:33
Solids, Total Dissolved TDS @ 180 C	3500	mg/L	10	104	90	110			
Method: A2540 C									Batch: TDS120522A
Sample ID: MBLK1	Method Blank				Run: BAL #11_120522B				05/22/12 12:05
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS1	Laboratory Control Sample				Run: BAL #11_120522B				05/22/12 12:05
Solids, Total Dissolved TDS @ 180 C	1950	mg/L	10	97	90	110			
Sample ID: B12051873-001A MS	Sample Matrix Spike				Run: BAL #11_120522B				05/22/12 12:05
Solids, Total Dissolved TDS @ 180 C	3950	mg/L	10	103	90	110			
Sample ID: B12051861-015A DUP	Sample Duplicate				Run: BAL #11_120522B				05/22/12 12:05
Solids, Total Dissolved TDS @ 180 C	11000	mg/L	10		90	110	0.8	5	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1664A									Batch: G_TPH120523A
Sample ID: MBLK1205230748	Method Blank				Run: SUB-G194886				05/23/12 11:54
Total Petroleum Hydrocarbons	ND	mg/L	0.4						
Sample ID: LCS1205230748	Laboratory Control Sample				Run: SUB-G194886				05/23/12 11:55
Total Petroleum Hydrocarbons	16	mg/L	5.0	80	64	132			
Sample ID: LCSD1205230748	Laboratory Control Sample Duplicate				Run: SUB-G194886				05/23/12 11:56
Total Petroleum Hydrocarbons	16	mg/L	5.0	81	64	132	0.6	34	
Sample ID: G12050533-002EMS	Sample Matrix Spike				Run: SUB-G194886				05/23/12 14:21
Total Petroleum Hydrocarbons	15	mg/L	5.0	73	64	132			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: **E300.0**								Analytical Run: IC203-B_120521A	
Sample ID: **ICV052112-11**	Initial Calibration Verification Standard							05/21/12 14:32	
Chloride	24.2	mg/L	1.0	97	90	110			
Method: **E300.0**								Batch: R185591	
Sample ID: **ICB052112-12**	Method Blank				Run: IC203-B_120521A			05/21/12 14:43	
Chloride	ND	mg/L	0.2						
Sample ID: **LFB052112-13**	Laboratory Fortified Blank				Run: IC203-B_120521A			05/21/12 14:55	
Chloride	24.1	mg/L	1.0	96	90	110			
Sample ID: **B12051861-003AMS**	Sample Matrix Spike				Run: IC203-B_120521A			05/22/12 01:50	
Chloride	579	mg/L	5.3	103	90	110			
Sample ID: **B12051861-003AMSD**	Sample Matrix Spike Duplicate				Run: IC203-B_120521A			05/22/12 02:01	
Chloride	579	mg/L	5.3	102	90	110	0.1	20	
Sample ID: **B12051861-014AMS**	Sample Matrix Spike				Run: IC203-B_120521A			05/22/12 04:25	
Chloride	11700	mg/L	26	93	90	110			
Sample ID: **B12051861-014AMSD**	Sample Matrix Spike Duplicate				Run: IC203-B_120521A			05/22/12 04:36	
Chloride	11700	mg/L	26	91	90	110	0.4	20	
Sample ID: **B12051861-024AMS**	Sample Matrix Spike				Run: IC203-B_120521A			05/22/12 07:01	
Chloride	11200	mg/L	26	100	90	110			
Sample ID: **B12051861-024AMSD**	Sample Matrix Spike Duplicate				Run: IC203-B_120521A			05/22/12 07:12	
Chloride	11300	mg/L	26	104	90	110	0.9	20	
Sample ID: **B12051861-031AMS**	Sample Matrix Spike				Run: IC203-B_120521A			05/22/12 17:40	
Chloride	35100	mg/L	130	106	90	110			
Sample ID: **B12051861-031AMSD**	Sample Matrix Spike Duplicate				Run: IC203-B_120521A			05/22/12 17:51	
Chloride	35200	mg/L	130	106	90	110	0.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185647
Sample ID: CCV052212	Continuing Calibration Verification Standard								05/22/12 11:23
Benzene	5.00	ug/L	1.0	100	70	130			
Ethylbenzene	5.16	ug/L	1.0	103	80	120			
Toluene	5.20	ug/L	1.0	104	80	120			
m+p-Xylenes	10.4	ug/L	1.0	104	70	130			
o-Xylene	5.24	ug/L	1.0	105	70	130			
Xylenes, Total	15.7	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	104	60	136			
Surr: Dibromofluoromethane			1.0	124	70	132			
Surr: p-Bromofluorobenzene			1.0	107	78	160			
Surr: Toluene-d8			1.0	107	75	138			
Method: SW8260B									Batch: R185647
Sample ID: LCS052212	Laboratory Control Sample				Run: SV5972.I_120522A				05/22/12 11:58
Benzene	5.28	ug/L	1.0	106	71	133			
Ethylbenzene	5.04	ug/L	1.0	101	78	131			
Toluene	5.44	ug/L	1.0	109	78	134			
m+p-Xylenes	9.80	ug/L	1.0	98	78	133			
o-Xylene	4.16	ug/L	1.0	83	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	96	70	130			
Surr: Dibromofluoromethane			1.0	96	77	126			
Surr: p-Bromofluorobenzene			1.0	108	76	127			
Surr: Toluene-d8			1.0	110	79	122			
Sample ID: BLK052212	Method Blank				Run: SV5972.I_120522A				05/22/12 12:57
Benzene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: 1,2-Dichloroethane-d4			1.0	103	70	130			
Surr: Dibromofluoromethane			1.0	104	77	126			
Surr: p-Bromofluorobenzene			1.0	108	76	127			
Surr: Toluene-d8			1.0	110	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185715
Sample ID: CCV052312	Continuing Calibration Verification Standard								05/23/12 11:23
Benzene	5.04	ug/L	1.0	101	70	130			
Ethylbenzene	5.08	ug/L	1.0	102	80	120			
Toluene	5.20	ug/L	1.0	104	80	120			
m+p-Xylenes	10.3	ug/L	1.0	103	70	130			
o-Xylene	5.20	ug/L	1.0	104	70	130			
Xylenes, Total	15.5	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	102	60	136			
Surr: Dibromofluoromethane			1.0	98	70	132			
Surr: p-Bromofluorobenzene			1.0	110	78	160			
Surr: Toluene-d8			1.0	107	75	138			
Method: SW8260B									Batch: R185715
Sample ID: LCS052312	Laboratory Control Sample				Run: SV5972.I_120523A				05/23/12 11:57
Benzene	5.28	ug/L	1.0	106	71	133			
Ethylbenzene	5.20	ug/L	1.0	104	78	131			
Toluene	5.36	ug/L	1.0	107	78	134			
m+p-Xylenes	10.6	ug/L	1.0	106	78	133			
o-Xylene	5.36	ug/L	1.0	107	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	104	70	130			
Surr: Dibromofluoromethane			1.0	119	77	126			
Surr: p-Bromofluorobenzene			1.0	111	76	127			
Surr: Toluene-d8			1.0	107	79	122			
Sample ID: BLK052312	Method Blank				Run: SV5972.I_120523A				05/23/12 12:54
Benzene	ND	ug/L	0.50						
Ethylbenzene	ND	ug/L	0.50						
Toluene	ND	ug/L	0.50						
m+p-Xylenes	ND	ug/L	0.50						
o-Xylene	ND	ug/L	0.50						
Xylenes, Total	ND	ug/L	0.50						
Surr: 1,2-Dichloroethane-d4			1.0	93	70	130			
Surr: Dibromofluoromethane			1.0	94	77	126			
Surr: p-Bromofluorobenzene			1.0	110	76	127			
Surr: Toluene-d8			1.0	121	79	122			
Sample ID: B12051861-032Cms	Sample Matrix Spike				Run: SV5972.I_120523A				05/23/12 22:26
Benzene	47.6	ug/L	2.5	72	71	133			
Ethylbenzene	21.8	ug/L	2.5	87	78	131			
Toluene	22.8	ug/L	2.5	91	78	134			
m+p-Xylenes	43.6	ug/L	2.5	87	78	133			
o-Xylene	22.4	ug/L	2.5	90	79	136			
Surr: 1,2-Dichloroethane-d4			5.0	106	70	130			
Surr: Dibromofluoromethane			5.0	106	77	126			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R185715
Sample ID: B12051861-032Cms	Sample Matrix Spike				Run: SV5972.I_120523A				05/23/12 22:26
Surr: p-Bromofluorobenzene			5.0	106	76	127			
Surr: Toluene-d8			5.0	105	79	122			
Sample ID: B12051861-032Cmsd	Sample Matrix Spike Duplicate				Run: SV5972.I_120523A				05/23/12 14:19
Benzene	53.2	ug/L	2.5	94	71	133	11	20	
Ethylbenzene	24.4	ug/L	2.5	98	78	131	11	20	
Toluene	26.0	ug/L	2.5	104	78	134	13	20	
m+p-Xylenes	50.0	ug/L	2.5	100	78	133	14	20	
o-Xylene	25.2	ug/L	2.5	101	79	136	12	20	
Surr: 1,2-Dichloroethane-d4			5.0	105	70	130			
Surr: Dibromofluoromethane			5.0	102	77	126			
Surr: p-Bromofluorobenzene			5.0	112	76	127			
Surr: Toluene-d8			5.0	108	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185748
Sample ID: CCV052412	Continuing Calibration Verification Standard								05/24/12 10:06
Benzene	4.88	ug/L	1.0	98	70	130			
Ethylbenzene	5.16	ug/L	1.0	103	80	120			
Toluene	5.32	ug/L	1.0	106	80	120			
m+p-Xylenes	10.9	ug/L	1.0	109	70	130			
o-Xylene	5.40	ug/L	1.0	108	70	130			
Xylenes, Total	16.3	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	97	60	136			
Surr: Dibromofluoromethane			1.0	99	70	132			
Surr: p-Bromofluorobenzene			1.0	98	78	160			
Surr: Toluene-d8			1.0	113	75	138			
Method: SW8260B									Batch: R185748
Sample ID: LCS052412	Laboratory Control Sample				Run: SV5972.I_120524A				05/24/12 10:41
Benzene	5.44	ug/L	1.0	109	71	133			
Ethylbenzene	5.52	ug/L	1.0	110	78	131			
Toluene	5.84	ug/L	1.0	117	78	134			
m+p-Xylenes	11.8	ug/L	1.0	118	78	133			
o-Xylene	5.80	ug/L	1.0	116	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	98	70	130			
Surr: Dibromofluoromethane			1.0	99	77	126			
Surr: p-Bromofluorobenzene			1.0	100	76	127			
Surr: Toluene-d8			1.0	112	79	122			
Sample ID: BLK052412	Method Blank				Run: SV5972.I_120524A				05/24/12 11:09
Benzene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	95	70	130			
Surr: Dibromofluoromethane			1.0	97	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	113	79	122			
Sample ID: B12052143-001Cms	Sample Matrix Spike				Run: SV5972.I_120524A				05/24/12 14:30
Benzene	11.0	ug/L	1.0	110	71	133			
Ethylbenzene	4.88	ug/L	1.0	98	78	131			
Toluene	5.32	ug/L	1.0	106	78	134			
m+p-Xylenes	10.4	ug/L	1.0	104	78	133			
o-Xylene	5.28	ug/L	1.0	106	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	108	70	130			
Surr: Dibromofluoromethane			1.0	104	77	126			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 05/30/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12051861

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R185748
Sample ID: B12052143-001Cms	Sample Matrix Spike				Run: SV5972.I_120524A				05/24/12 14:30
Surr: p-Bromofluorobenzene			1.0	101	76	127			
Surr: Toluene-d8			1.0	110	79	122			
Sample ID: B12052143-001Cmsd	Sample Matrix Spike Duplicate				Run: SV5972.I_120524A				05/24/12 14:58
Benzene	10.9	ug/L	1.0	109	71	133	0.7	20	
Ethylbenzene	4.88	ug/L	1.0	98	78	131	0.0	20	
Toluene	5.28	ug/L	1.0	106	78	134	0.8	20	
m+p-Xylenes	10.2	ug/L	1.0	102	78	133	1.9	20	
o-Xylene	5.32	ug/L	1.0	106	79	136	0.8	20	
Surr: 1,2-Dichloroethane-d4			1.0	110	70	130			
Surr: Dibromofluoromethane			1.0	106	77	126			
Surr: p-Bromofluorobenzene			1.0	101	76	127			
Surr: Toluene-d8			1.0	109	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Workorder Receipt Checklist

B12051861

Geosyntec Consultants

Login completed by: Jill M. Lippard
Date Received: 5/21/2012

Reviewed by: BL2000\kmcdonald
Received by: lg

Reviewed Date: 5/23/2012
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☐	No ☑	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Container/Temp Blank temperature:	℃ On Ice, Temp Blank		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

Temp Blank temperature for Cooler 1 was 1.6℃, Cooler 2 was 1.8℃, Cooler 3 was 1.5℃, Cooler 4 was 1.6℃, and Cooler 5 was 1.4℃.

No unpreserved sample container was received for the Equip Blank sample so it is not possible to analyze Chloride or Total Dissolved Solids on this sample. Per email from Christa Tyrrell, Chloride and TDS are not needed on the Equip Blank sample.

For PNR-8, the sample time is listed as 08:15 on the Chain of Custody but the sample time is marked as 09:05 on the container label. Used sample time of 09:05 for analysis per container label.

Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☒ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) C. Leibi
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order: 58828 & 58949

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ A2LA
☐ GSA ☐ EDD/EDT (Electronic Data) Format: _____
☐ POTW/WWTP ☐ LEVEL IV
☐ State: _____ ☐ NELAC
☐ Other: _____

RUSH — Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:
Cooler 1 1.6
Cooler 2 1.8
Cooler 3 1.5
Cooler 4 1.6
Cooler 5 1.4

Shipped by: Hand
Cooler ID(s):
Receipt Temp: See notes °C
On Ice: (Yes) No
Custody Seal Intact: (N) Y
Signature Match: Y

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Number of Containers / Sample Type: A W S V B O / Air Water Soils/Solids Vegetation Bioassay Other	Cl, TDS	BTEX, TPH	SEE ATTACHED	Normal Turnaround (TAT)	
1	MOC-1B	5/16/12	12:37		1	X				B120518 61-001
1	PNR-12		13:47		1	X				-002
1	MOC-3		15:56		1	X				-003
1	PNR-13		17:25		1	X				-004
1	MOC-20B	5/17/12	12:30		1	X				-005
1	MOC-20B-DUP	"	12:30		1	X				-006
1	PNR-22	"	13:41		1	X				-007
1	MOC-4	"	15:02		1	X				-008
2	MOC-20A	5/18/12	8:15		1	X				-009
2	PNR-8	"	8:15		1	X				-010

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Chris Leibi	Date/Time: 5/18/12 15:15	Signature:	Received by (print): Jim Potts	Date/Time: 5/18/12 15:15
Relinquished by (print): Jim Potts	Date/Time: 5/19/12 14:00	Signature:	Received by (print):	Date/Time:
Sample Disposal: Return to Client: _____	Lab Disposal: _____		Received by Laboratory:	Date/Time: 5-21-12 7:00

Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) C. Le.bl.
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order: 58828 + 58949

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

- ☐ DW
- ☐ GSA
- ☐ POTW/WWTP
- ☐ State: _____
- ☐ Other: _____
- ☐ A2LA
- ☐ EDD/EDT (Electronic Data) Format: _____
- ☐ LEVEL IV
- ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

SEE ATTACHED

Normal Turnaround (TAT)

RUSH

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Fed Ex

Cooler ID(s):

Receipt Temp: See Note °C

On Ice: (Yes) No

Custody Seal (N) Intact Y Signature Match Y

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH	BTEX										
2	1 MW-60	5/18/12	11:15	GW	X	X											B205186 1-011
2	2 MW-60-DUP	"	11:15	GW	X	X											-012
2	3 Equip Blank	"	14:25	3W	X		X										-013
	4																
	5																
	6																
	7																
	8																
	9																
	10																

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Chris Le.bl.	Date/Time: 5/18/12 15:15	Signature:	Received by (print): Sim Potts	Date/Time: 5/18/12 15:15	Signature:
Relinquished by (print): Sim Potts	Date/Time: 5/19/12 14:00	Signature:	Received by (print):	Date/Time:	Signature:
Sample Disposal: Return to Client: _____		Lab Disposal: _____	Received by Laboratory:	Date/Time: 5-21-12 7:00	Signature:

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Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.

Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☒ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) C. Murch
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order: 58828/58949

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ GSA ☐ POTW/WWTP ☐ State: _____ ☐ Other: _____
☐ A2LA ☐ EDD/EDT (Electronic Data) Format: _____ ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A Air W Water S Soils/Solids V Vegetation B Biocassay O Other

ANALYSIS REQUESTED

SEE ATTACHED

Normal Turnaround (TAT)

RUSH

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand

Cooler ID(s):

Receipt Temp: See notes C

On Ice: (Yes) No

Custody Seal Y (N)

Intact Y

Signature Match Y

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH										
1	PNR-39-08	5/16/12	12:39	1W	X											B1205186-014
2	USGS-93-3	"	15:07	1W	X											-015
3	PNR-40-12	5/17/12	11:43	1W	X											-016
4	M-28	"	14:20	6W	X	X										-017
5	PNR-21	"	15:37	6W	X	X										-018
6	PNR-34-07	"	16:46	1W	X											-019
7	MOC-2	5/18/12	9:19	1W	X											-020
8	M-31	"	11:38	6W	X	X										-021
9																
10																

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Cook Murch	Date/Time: 5/18/12 1500	Signature: Cook Murch	Received by (print): Sues ERRO	Date/Time: 5/18/12 15:15
Relinquished by (print): Jim Potter	Date/Time: 5/19/12 14:00	Signature: Jim Potter	Received by (print):	Date/Time:
Sample Disposal: Return to Client: _____		Lab Disposal: _____	Received by Laboratory:	Date/Time: 5-21-12 7:00

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Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☒ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) S. Potts
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order: 58828/58949

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ GSA ☐ POTW/WWTP ☐ State: _____ ☐ Other: _____
☐ A2LA ☐ EDD/EDT (Electronic Data) Format: _____ ☐ LEVEL IV ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

SEE ATTACHED

Normal Turnaround (TAT)

RUSH

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: hand
Cooler ID(s):
Receipt Temp: See notes
On Ice: (Yes) No
Custody Seal (N)
Intact Y
Signature Match Y

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH									LABORATORY USE ONLY
1	PNR-14	5/16/12	14:10	1W	X										B205186-022
2	PNR-5	"	15:20	1W	X										-023
3	PNR-27	"	16:50	1W	X										-024
4	M-27	"	17:35	1W	X										-025
5	PNR-28	5/17/12	9:32	1W	X										-026
6	PNR-28-DUP	"	9:45	1W	X										-027
7	PNR-19	"	11:30	6W	X	X									-028
8	PNR-33	"	12:42	6W	X	X									-029
9	PNR-24	"	13:18	6W	X	X									-030
10	PNR-20	"	14:50	6W	X	X									-031

Custody Record MUST be Signed

Relinquished by (print): Jim Potts	Date/Time: 5/19/12 14:00	Signature:	Received by (print): / Date/Time: / Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print): / Date/Time: / Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: _____			Received by Laboratory: Date/Time: 5-21-12 7:00

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Chain of Custody and Analytical Request Record

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☒ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) J. Potts
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order: 58828 / 58949

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☐ DW ☐ A2LA
☐ GSA ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A Air W Water S Soils/Solids V Vegetation B Bioassay O Other

ANALYSIS REQUESTED

RUSH

Contact ELI prior to RUSH sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Hand
Cooler ID(s):
Receipt Temp: See notes
On Ice: (Yes) No
Custody Seal: Y (N)
Intact: Y
Signature Match: Y

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH	SEE ATTACHED	Normal Turnaround (TAT)		
1	PNR-7	5/18/12	9:20	GW	X	X				B120518 61-032
2	PNR-38-08	"	11:34	W	X					-033
3	Cooler #1 NO TB									
4	TB#2 050212-B TS SHP0255									-034
5	TB#3 050212-B TS SHP0255									-035
6	TB#4 050212-B TS SHP0255									-036
7	TB#5 050212-B TS SHP0255									-037
8										
9										
10										

LABORATORY USE ONLY

Custody Record MUST be Signed

Relinquished by (print): Jim Potts	Date/Time: 5/19/12 14:00	Signature:	Received by (print): / Date/Time: / Signature:
Relinquished by (print):	Date/Time:	Signature:	Received by (print): / Date/Time: / Signature:
Sample Disposal: Return to Client: _____ Lab Disposal: _____			Received by Laboratory: Date/Time: 5-21-12 7:00 Signature:

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ANALYTICAL SUMMARY REPORT

June 04, 2012

Geosyntec Consultants
55 SW Yamhill St Ste 200
Portland, OR 97204-3338

Workorder No.: B12052143

Project Name: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A

Energy Laboratories Inc Billings MT received the following 2 samples for Geosyntec Consultants on 5/23/2012 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
B12052143-001	PNR-RW-13	05/20/12 14:30	05/23/12	Aqueous	Hydrocarbons, Total Petroleum Anions by Ion Chromatography Solids, Total Dissolved 8260-Volatile Organic Compounds-BTEX
B12052143-002	PNR-41-12	05/20/12 12:00	05/23/12	Aqueous	Anions by Ion Chromatography Solids, Total Dissolved

The analyses presented in this report were performed by Energy Laboratories, Inc., 1120 S 27th St., Billings, MT 59101, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on an as received basis unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

CLIENT: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0
Sample Delivery Group: B12052143

Report Date: 06/04/12

CASE NARRATIVE

Tests associated with analyst identified as ELI-G were subcontracted to Energy Laboratories, 400 W Boxelder Rd, Gillette, WY, EPA Number WY00006.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12052143-001
Client Sample ID PNR-RW-13

Report Date: 06/04/12
Collection Date: 05/20/12 14:30
DateReceived: 05/23/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	29400	mg/L		10		A2540 C	05/23/12 15:36 / ser
INORGANICS							
Chloride	19900	mg/L	D	100		E300.0	05/25/12 08:13 / jrs
VOLATILE ORGANIC COMPOUNDS							
Benzene	5.5	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
Ethylbenzene	ND	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
Toluene	ND	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
m+p-Xylenes	ND	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
o-Xylene	ND	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
Xylenes, Total	ND	ug/L		1.0		SW8260B	05/24/12 13:03 / nl
Surr: 1,2-Dichloroethane-d4	105	%REC		70-130		SW8260B	05/24/12 13:03 / nl
Surr: Dibromofluoromethane	102	%REC		77-126		SW8260B	05/24/12 13:03 / nl
Surr: p-Bromofluorobenzene	103	%REC		76-127		SW8260B	05/24/12 13:03 / nl
Surr: Toluene-d8	108	%REC		79-122		SW8260B	05/24/12 13:03 / nl
ORGANIC CHARACTERISTICS							
Total Petroleum Hydrocarbons	ND	mg/L		1		E1664A	05/31/12 12:30 / eli-g

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

LABORATORY ANALYTICAL REPORT

Prepared by Billings, MT Branch

Client: Geosyntec Consultants
Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A
Lab ID: B12052143-002
Client Sample ID PNR-41-12

Report Date: 06/04/12
Collection Date: 05/20/12 12:00
DateReceived: 05/23/12
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
PHYSICAL PROPERTIES							
Solids, Total Dissolved TDS @ 180 C	3230	mg/L		10		A2540 C	05/23/12 15:36 / ser
INORGANICS							
Chloride	910	mg/L	D	5		E300.0	05/24/12 03:35 / jrs

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.
D - RL increased due to sample matrix.
MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12052143

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: A2540 C									Batch: TDS120523A
Sample ID: MBLK2	Method Blank				Run: BAL #11_120523B				05/23/12 15:34
Solids, Total Dissolved TDS @ 180 C	ND	mg/L	10						
Sample ID: LCS2	Laboratory Control Sample				Run: BAL #11_120523B				05/23/12 15:34
Solids, Total Dissolved TDS @ 180 C	1970	mg/L	10	98	90	110			
Sample ID: B12052062-001A MS	Sample Matrix Spike				Run: BAL #11_120523B				05/23/12 15:35
Solids, Total Dissolved TDS @ 180 C	2140	mg/L	10	99	90	110			
Sample ID: B12052107-002A DUP	Sample Duplicate				Run: BAL #11_120523B				05/23/12 15:35
Solids, Total Dissolved TDS @ 180 C	57.0	mg/L	10		90	110	1.0	5	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12052143

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1664A									Batch: G_TPH120531A
Sample ID: MBLK1205310737	Method Blank				Run: SUB-G195055				05/31/12 11:49
Total Petroleum Hydrocarbons	ND	mg/L	0.4						
Sample ID: LCS1205310737	Laboratory Control Sample				Run: SUB-G195055				05/31/12 11:50
Total Petroleum Hydrocarbons	15	mg/L	5.0	75	64	132			
Sample ID: LCSD1205310737	Laboratory Control Sample Duplicate				Run: SUB-G195055				05/31/12 11:51
Total Petroleum Hydrocarbons	16	mg/L	5.0	78	64	132	4.6	34	
Sample ID: G12050635-001EMS	Sample Matrix Spike				Run: SUB-G195055				05/31/12 12:33
Total Petroleum Hydrocarbons	19	mg/L	5.0	91	64	132			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/04/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12052143

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E300.0								Analytical Run: IC202-B_120524A	
Sample ID: ICV052412-11	Initial Calibration Verification Standard							05/24/12 13:11	
Chloride	24.1	mg/L	1.0	96	90	110			
Method: E300.0								Batch: R185784	
Sample ID: ICB052412-12	Method Blank				Run: IC202-B_120524A			05/24/12 13:27	
Chloride	0.08	mg/L	0.04						
Sample ID: LFB052412-13	Laboratory Fortified Blank				Run: IC202-B_120524A			05/24/12 13:42	
Chloride	23.9	mg/L	1.0	95	90	110			
Sample ID: B12052123-001AMS	Sample Matrix Spike				Run: IC202-B_120524A			05/25/12 06:57	
Chloride	361	mg/L	1.0		90	110			A
Sample ID: B12052123-001AMSD	Sample Matrix Spike Duplicate				Run: IC202-B_120524A			05/25/12 07:12	
Chloride	361	mg/L	1.0		90	110	0.1	20	A
Sample ID: B12052150-005AMS	Sample Matrix Spike				Run: IC202-B_120524A			05/25/12 10:29	
Chloride	281	mg/L	2.6	103	90	110			
Sample ID: B12052150-005AMSD	Sample Matrix Spike Duplicate				Run: IC202-B_120524A			05/25/12 10:44	
Chloride	278	mg/L	2.6	102	90	110	1.1	20	
Method: E300.0								Analytical Run: IC203-B_120523A	
Sample ID: ICV052312-11	Initial Calibration Verification Standard							05/23/12 17:35	
Chloride	24.5	mg/L	1.0	98	90	110			
Method: E300.0								Batch: R185739	
Sample ID: ICB052312-12	Method Blank				Run: IC203-B_120523A			05/23/12 17:46	
Chloride	ND	mg/L	0.2						
Sample ID: LFB052312-13	Laboratory Fortified Blank				Run: IC203-B_120523A			05/23/12 17:57	
Chloride	24.3	mg/L	1.0	97	90	110			
Sample ID: B12052107-001AMS	Sample Matrix Spike				Run: IC203-B_120523A			05/24/12 02:17	
Chloride	25.6	mg/L	1.0	101	90	110			
Sample ID: B12052107-001AMSD	Sample Matrix Spike Duplicate				Run: IC203-B_120523A			05/24/12 02:29	
Chloride	25.7	mg/L	1.0	101	90	110	0.5	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/01/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12052143

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Analytical Run: R185748
Sample ID: CCV052412	Continuing Calibration Verification Standard								05/24/12 10:06
Benzene	4.88	ug/L	1.0	98	70	130			
Ethylbenzene	5.16	ug/L	1.0	103	80	120			
Toluene	5.32	ug/L	1.0	106	80	120			
m+p-Xylenes	10.9	ug/L	1.0	109	70	130			
o-Xylene	5.40	ug/L	1.0	108	70	130			
Xylenes, Total	16.3	ug/L	1.0		0	0			
Surr: 1,2-Dichloroethane-d4			1.0	97	60	136			
Surr: Dibromofluoromethane			1.0	99	70	132			
Surr: p-Bromofluorobenzene			1.0	98	78	160			
Surr: Toluene-d8			1.0	113	75	138			
Method: SW8260B									Batch: R185748
Sample ID: LCS052412	Laboratory Control Sample				Run: SV5972.I_120524A				05/24/12 10:41
Benzene	5.44	ug/L	1.0	109	71	133			
Ethylbenzene	5.52	ug/L	1.0	110	78	131			
Toluene	5.84	ug/L	1.0	117	78	134			
m+p-Xylenes	11.8	ug/L	1.0	118	78	133			
o-Xylene	5.80	ug/L	1.0	116	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	98	70	130			
Surr: Dibromofluoromethane			1.0	99	77	126			
Surr: p-Bromofluorobenzene			1.0	100	76	127			
Surr: Toluene-d8			1.0	112	79	122			
Sample ID: BLK052412	Method Blank				Run: SV5972.I_120524A				05/24/12 11:09
Benzene	ND	ug/L	1.0						
Ethylbenzene	ND	ug/L	1.0						
Toluene	ND	ug/L	1.0						
m+p-Xylenes	ND	ug/L	1.0						
o-Xylene	ND	ug/L	1.0						
Xylenes, Total	ND	ug/L	1.0						
Surr: 1,2-Dichloroethane-d4			1.0	95	70	130			
Surr: Dibromofluoromethane			1.0	97	77	126			
Surr: p-Bromofluorobenzene			1.0	104	76	127			
Surr: Toluene-d8			1.0	113	79	122			
Sample ID: B12052143-001Cms	Sample Matrix Spike				Run: SV5972.I_120524A				05/24/12 14:30
Benzene	11.0	ug/L	1.0	110	71	133			
Ethylbenzene	4.88	ug/L	1.0	98	78	131			
Toluene	5.32	ug/L	1.0	106	78	134			
m+p-Xylenes	10.4	ug/L	1.0	104	78	133			
o-Xylene	5.28	ug/L	1.0	106	79	136			
Surr: 1,2-Dichloroethane-d4			1.0	108	70	130			
Surr: Dibromofluoromethane			1.0	104	77	126			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Billings, MT Branch

Client: Geosyntec Consultants **Report Date:** 06/01/12

Project: Mesa-Biere 1-22 Well Site (PNR MB1-22) PNR0522-02A **Work Order:** B12052143

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW8260B									Batch: R185748
Sample ID: B12052143-001Cms	Sample Matrix Spike				Run: SV5972.I_120524A				05/24/12 14:30
Surr: p-Bromofluorobenzene			1.0	101	76	127			
Surr: Toluene-d8			1.0	110	79	122			
Sample ID: B12052143-001Cmsd	Sample Matrix Spike Duplicate				Run: SV5972.I_120524A				05/24/12 14:58
Benzene	10.9	ug/L	1.0	109	71	133	0.7	20	
Ethylbenzene	4.88	ug/L	1.0	98	78	131	0.0	20	
Toluene	5.28	ug/L	1.0	106	78	134	0.8	20	
m+p-Xylenes	10.2	ug/L	1.0	102	78	133	1.9	20	
o-Xylene	5.32	ug/L	1.0	106	79	136	0.8	20	
Surr: 1,2-Dichloroethane-d4			1.0	110	70	130			
Surr: Dibromofluoromethane			1.0	106	77	126			
Surr: p-Bromofluorobenzene			1.0	101	76	127			
Surr: Toluene-d8			1.0	109	79	122			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Workorder Receipt Checklist

B12052143

Geosyntec Consultants

Login completed by: Randa Nees
Date Received: 5/23/2012
Reviewed by: BL2000\gmccartney
Received by: gmm
Reviewed Date: 5/23/2012
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Container/Temp Blank temperature:	1.4°C On Ice/Temp. Blank		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	Not Applicable ☐

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

Page 1 of 1

PLEASE PRINT- Provide as much information as possible.

Company Name: Geosyntec	Project Name, PWS, Permit, Etc.: Mesa-Biere 1-22 Well Site Project (PNR MB1-22) Project Number: PNR0522-02A	Sample Origin State: MT	EPA/State Compliance: Yes ☐ No ☐
Report Mail Address: 1201 Third Avenue, Suite 330, Seattle, WA 98101 Preferred Method– Email Report: CTyrrell@Geosyntec.com	Contact Name: Christa Tyrrell Phone/Fax: O:206-496-1451 C:406-209-1905	Email: CTyrrell@Geosyntec.com	Sampler: (Please Print) MU, GW
Invoice Address: 55 SW Yamhill Street, Suite 200, Portland, Oregon 97204	Invoice Contact & Phone: Lisa Curtis O:503-222-9518 E: LCurtis@Geosyntec.com	Purchase Order:	Quote/Bottle Order:

Special Report/Formats – ELI must be notified prior to sample submittal for the following:

☐ DW ☐ A2LA
☐ GSA ☐ EDD/EDT (Electronic Data)
☐ POTW/WWTP Format: _____
☐ State: _____ ☐ LEVEL IV
☐ Other: _____ ☐ NELAC

Number of Containers
Sample Type: A W S V B O
Air Water Soils/Solids Vegetation Bioassay Other

ANALYSIS REQUESTED

SEE ATTACHED

RUSH

Contact ELI prior to **RUSH** sample submittal for charges and scheduling – See Instruction Page

Comments:

Shipped by: Hand Del

Cooler ID(s):

Receipt Temp 1.4 °C TB

On Ice: (Yes) No

Custody Seal Y N
Intact Y N
Signature Match Y N

	SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	Cl, TDS	BTEX, TPH-1664								SEE ATTACHED	Normal Turnaround (TAT)	RUSH	Comments	LABORATORY USE ONLY
1	PNR-RW-13	5/20/2012	1430	W	✓	✓									✓			B12052143-001
2	PNR-A1-12	5/20/2012	1200	W	✓										✓			-1 002
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Page

Custody Record MUST be Signed

Relinquished by (print): Matt Usuriello	Date/Time: 5/23/12	Signature: Matt Usuriello	Received by (print):
Relinquished by (print):	Date/Time:	Signature:	Received by (print):
Sample Disposal: Return to Client: _____	Lab Disposal: _____		Received by Laboratory: Date/Time: 5-23-12 12:30 Signature:

In certain circumstances, samples submitted to Energy Laboratories, Inc. may be subcontracted to other certified laboratories in order to complete the analysis requested.
This serves as notice of this possibility. All sub-contract data will be clearly notated on your analytical report.
Visit our web site at www.energylab.com for additional information, downloadable fee schedule, forms, and links.